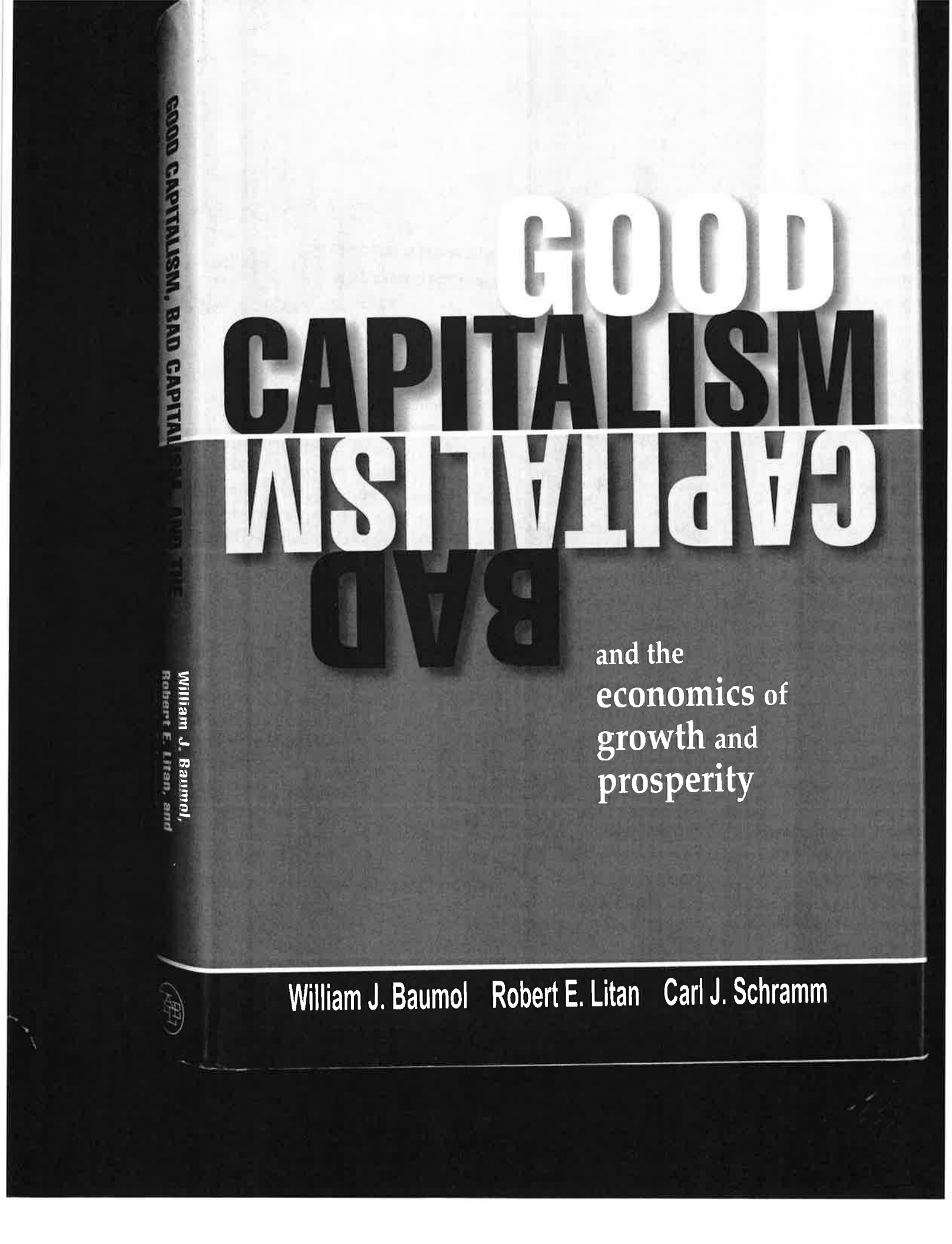
GOOD CAPITALISM, BAD CAPITALISM, AND THE
William J. Baumol, Robert E. Litan, and
GOOD
CAPITALISM
BAD
CAPITALISM
and the economics of growth and prosperity
William J. Baumol Robert E. Litan Carl J. Schramm

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ENTREPRENEURSHIP AND GROWTH: A MISSING PIECE OF THE PUZZLE

The most astonishing thing about the extraordinary outpouring of growth and innovation that the United States and other economies have achieved over the past two centuries is that it does not astonish us. Throughout most of human history, life expectancy was about half what it now is, or even less. We could not record voices or speech, so no one knows how Shakespeare sounded or how "to be or not to be" was pronounced. The streets of the greatest cities were dark every night. No one traveled on land faster than a horse could gallop. The battle of New Orleans took place after the peace treaty had been signed in Europe because General Andrew Jackson had no way of knowing this. In Europe, famines were expected about once a decade and the streets would be littered with corpses, and in American homes, every winter the ink in inkwells froze.

Today we can create paintings on our laptop computers, put the artwork on a Web page, and quickly receive comments about it from all over the globe. There are two toy-like vehicles driving over the terrain of Mars, analyzing its surface materials and sending back crystal clear motion pictures in color. But after the initial awe and enthusiasm, this ongoing interplanetary research merits only brief notices on the inside pages of our newspapers. For the average citizen, the most plausible explanation of how these things work is that they are acts of magic, yet we have come to take such technological innovations for granted.

Economic growth has been equally astounding. It is estimated that the purchasing power of an average American a century ago was one-tenth

what it is today. A moment's thought will make you realize what a significant change has occurred in an individual's economic circumstances over the past few generations. Suppose you were accustomed to receiving the income of an average American today, and suddenly nine-tenths of it were confiscated. We cannot imagine what our mode of living would then be like. Similar calculations can be made for other countries that have grown remarkably fast in recent years: India, China, much of Southeast Asia during the past two decades and, of course, both Western Europe and Japan since the end of World War II.

The fact is that never before in human history has there been anything like the economic progress that citizens of these countries have been privileged to witness and enjoy. The current most critical long-term economic issue for the world is how this performance can be sustained in the wealthiest countries and how it can be transplanted to societies where much of the population lives in abject poverty. To find an answer to these questions, it is necessary to investigate what is different about the economies that have already achieved this spectacular success.

In the past couple of decades, after a long spell of inattention, there has been a resurgence of interest in this topic among economists claiming to have some of the answers. (We will express our skepticism about some of their work in a later chapter.) Of course, we certainly do not pretend to have the "silver bullet" answer to what causes differences in economic growth rates among countries and over time, but we do believe we can contribute to the inquiry by focusing on the overall structure of economies (capitalist economies in particular) that could explain some portion, perhaps a good portion, of the variation. In particular, we will pay special attention to the set of rules and institutions that provide the incentives for entrepreneurs to work unceasingly for the creation, utilization, and dissemination of new products and productive techniques. Indeed, we will argue that these incentives prevent the entrepreneurs in key sectors of different economies from resting on their laurels, forcing them to start planning their next innovative campaign even before the current one has reached its conclusion.

By "entrepreneurs" whom do we mean? The term is commonly used to refer to anyone who starts a business. This definition counts the numbers of self-employed persons and new business starts, regardless of what the

business does. Throughout this book, we will use the term in a narrower and, we believe, more significant manner: as any entity, new or existing, that provides a *new* product or service or that develops and uses *new* methods to produce or deliver existing goods and services at lower cost. As management guru Peter Drucker has pointed out, "not every new small business is entrepreneurial or represents entrepreneurship" (Drucker, 1965, 21). He (and we) prefer the definition that Drucker attributed to the nineteenth-century French economist Jean-Baptiste Say, noting that the term: "was intended as a manifesto and a declaration of dissent: the entrepreneur upsets and disorganizes." Joseph Schumpeter (the great twentieth-century economist who celebrated the role of the entrepreneur) coined the famous term "creative destruction" to describe the entrepreneurial process. As Drucker paraphrases Schumpeter's analysis: "[the] dynamic disequilibrium brought on by the innovating entrepreneur, rather than equilibrium and optimization, is the 'norm' of a healthy economy and the central reality for economic theory and economic practice" (Drucker, 27). Or, Drucker puts it more bluntly: "Entrepreneurs innovate. Innovation is the specific instrument of entrepreneurship" (Drucker, 30).

By focusing narrowly on what might be called "innovative" entrepreneurs, we admittedly give short shrift to the many more "replicative" entrepreneurs—those producing or selling a good or service already available through other sources—who are found throughout capitalist economies. Eighteenth-century English writer Richard Cantillon had replicative entrepreneurs in mind (although he probably didn't know it at the time) when he referred to "wholesalers in Wool and Corn, Bakers, Butchers, Manufacturers and Merchants of all kinds who buy country product to work them up and resell them gradually as the Inhabitants require them" (Cantillon, 1931, 51). To be sure, replicative entrepreneurship is important in most economies because it represents a route out of poverty, a means by which people with little capital, education, or experience can earn a living. But if economic growth is the object of interest, then it is the innovative entrepreneur who matters; hence our focus on that form of entrepreneurship throughout much of this book. Put differently, entrepreneurship—as we use the term—is not to be confused with "small business" or even many new businesses.

We recognize, of course, that no economy can be fully successful with entrepreneurs alone. Many such firms will be too small to realize economies of scale. And there is a long distance between what may be the germ of a radical, but useful, idea generated by an entrepreneur and a commercially useful product that is sufficiently affordable and reliable to induce many consumers to buy it. For this reason, the most successful economies are those that have a mix of innovative entrepreneurs and larger, more established firms (often two or more generations removed from their entrepreneurial founding) that refine and mass-produce the innovations that entrepreneurs (and, on occasion, the large firms themselves) bring to market. When we speak of "entrepreneurial economies" at various points in the book, we are referring to this blend of the two types of firms.

What Drives Economic Growth?

To some readers perhaps unfamiliar with much economic writing what we have presented so far may seem obvious. After all, growing economies seem to thrive on new things—new cars, new products, new services. But look through any basic economics textbook and you'll find precious little discussion, let alone analysis, of the entrepreneurs who think up and commercialize many of these new things. In more advanced textbooks and articles, one will find extensive, usually highly mathematical discussions of what determines economic growth. But here, too, entrepreneurship, and the accompanying necessary role of larger firms, is rarely mentioned.[1] Nobel Laureate Ronald Coase put it well when he observed: "The entities whose decisions economists are engaged in analyzing have not been made the subject of study and in consequence lack any substance. The consumer is not a human being but a consistent set of preferences. *The firm, to an economist, as Slater has said, 'is effectively defined as a cost curve and a demand curve, and the theory is simply the logic of optimal pricing and input combination'* (Slater, 1980, ix). Exchange takes place without any specification of its institutional setting. We have consumers without humanity, firms without organization, and even exchange without markets" (Coase, 1988, 3).

Instead, economists generally focus on two main sources of growth: (1) the addition of more inputs (capital and labor), and (2) innovation, tech-

nological change, or, in technical economic terms, "total factor productivity" (the increase in productivity of *both* capital and labor, considered together). For simplicity, one could call these two different strategies growth by "brute force" and "smart growth." Robert Solow of MIT won his Nobel Prize in economics for showing in the late 1950s that in the United States and a few other industrialized countries, innovation or "smart growth" was more important than brute force (more inputs) in generating additions to output over time (Solow, 1956, 1957). A number of scholars have since confirmed this basic insight and extended it to many countries around the world (see Denison, 1962, 1967; and Easterly and Levine, 2001).

But what is innovation, beyond something new? As we (and others) use the term, it is the *marriage* of new knowledge, embodied in an invention, with the successful introduction of that invention into the marketplace. Even the best inventions are useless unless they have been designed, marketed, and modified in ways that make them commercially viable. This requires someone who realizes the commercial opportunity presented by the innovation (or even a seemingly small element of the breakthrough), which sometimes is not the purpose the inventor had in mind, and then takes all the steps necessary to turn that opportunity into something many consumers will want to buy. These tasks are inherently entrepreneurial, an insight we will return to repeatedly throughout this book.

So what determines innovation? In Solow's model, innovation is like manna from heaven, something that policy makers largely cannot control. Although they may modestly influence it by way of government-funded research or incentives for research and development, the pace of innovation is essentially taken as a given. A growing number of economists have been uncomfortable with that assumption, and over the past two decades they have put much effort into a better explanation of innovation's role in economic growth. These researchers, using increasingly sophisticated statistical methods, have posited a range of other variables that influence innovation, some of which governments can control (like openness to goods and investment from abroad, spending on research and development, and training of more scientists and engineers), and others of which governments cannot control (like geographic location). We discuss these efforts in chapter 3.

We do not take the position that these factors are unimportant, because many or most of them are. Instead, we suggest that it is more useful to pare down (economize, if you will) the list of suggestions that societies should implement by thinking of economies as potential "growth machines," which need fuel to operate but which also must have some essential primary parts or components that work in harmony if they are to promote entrepreneurship, innovation (and its dissemination), and growth most effectively. The "fuel" for an economy is the right set of macroeconomic policies: essentially, prudent fiscal and monetary policies to keep inflation low and relatively stable and to prevent economic downturns (or even worse, financial crises) from derailing progress toward growth in the long run. We realize that maintaining macroeconomic stability is far from easy. Indeed, it is the focus of much, if not most, of the attention political leaders give to economic policy. But by definition, economic growth is a long-run phenomenon, and so the much greater challenge is to design and implement policies that foster growth in the long run.

We believe that policy makers are most usefully served by having a relatively simple framework for achieving this objective. Not a ten-point list, such as the so-called Washington Consensus list of reforms, or even longer lists of policy prescriptions, which we discuss in chapter 3. The danger in long lists is that they are too easily ignored by busy policy makers, who generally operate under the intense pressure of competing interest groups and have the energy and political capital to concentrate on only a few major endeavors at a time. The other extreme, the search for a single silver bullet answer to the growth problem, is equally dangerous. Economic systems are complicated, and no single policy prescription, even if followed to the letter, is likely to be sufficient to ensure rapid, sustainable growth over the long run.

We attempt to strike a balance between these extremes in concentrating on four factors or conditions that we believe are most important in contributing to long-run growth for all capitalist economies, but especially for those at the "technological frontier," where future progress *requires* continued innovation more than it does mere replication. We flesh these out in greater detail in chapter 4 but give a brief preview here so readers can keep them in mind before proceeding further. The factors should be understood as forming the bare blueprint of a well-oiled growth machine—the

"big picture" that busy policy makers can keep in mind when considering more detailed initiatives or programs.

We also limit our attention to growth-enhancing conditions for capitalist economies, or those that at least to some degree allow private ownership of property and reward individuals and firms for serving consumer needs. Although we discuss in some detail in chapter 5 different models of capitalism—and elevate one of them, "entrepreneurial capitalism," above all the rest—the various models differ sharply from the central planning that governed much of the world (the Soviet Union, Eastern Europe, and China) from the end of World War II until the fall of the Berlin Wall in 1989. History has shown that central planning cannot deliver high and rapidly improving standards of living and we therefore will not consider it (even though central planning lives on in a few dark corners of the world, notably Cuba and North Korea).

Our four elements of a well-oiled economic growth machine, the *successful entrepreneurial economy,* are the following:

1. First, and perhaps quite obviously, in the successful entrepreneurial economy, it must be relatively easy to form a business, without expensive and time-consuming bureaucratic red tape. As a corollary, abandoning a failed business (that is, declaring bankruptcy) must also not be too difficult because, otherwise, some would-be entrepreneurs may be deterred from starting in the first place. A reasonably well-functioning financial system must also exist, one that channels the funds of savers to the users of funds, entrepreneurs in particular. And the importance of flexible labor markets cannot be overstated: if entrepreneurs cannot attract new labor, they cannot grow, nor will they want to grow if labor rules are overly restrictive (especially if rules limit the ability of firms to fire nonperforming workers or shed workers they no longer need).
2. Second, institutions must reward socially useful entrepreneurial activity once started; otherwise individuals cannot be expected to take the risks of losing their money and their time in ill-fated ventures. Here, the rule of law—property and contract rights in particular—is especially important.
3. Third, government institutions must discourage activity that aims to divide up the economic pie rather than increase its size. Such socially

unproductive (though, in a sense, entrepreneurial) activities include criminal behavior (selling of illegal drugs, for example) as well lawful "rent-seeking" behavior (i.e., political lobbying or the filing of frivolous lawsuits designed to transfer wealth from one pocket to another).

4. Finally, in the successful entrepreneurial economy, government institutions must ensure that the winning entrepreneurs and the larger established companies (which were launched at some earlier time by entrepreneurs) continue to have incentives to innovate and grow, or else economies will sink into stagnation. The ostensible importance of effective antitrust laws here comes to mind, but we place greater emphasis on openness to trade (which works automatically and without the long lead times inherent in legal antitrust enforcement).

We suspect that there will be a great temptation among some readers to ask: What about this, or what about that? Why shouldn't some other things be on the list? For example, one obvious challenge is from those who believe, as does David Landes of Harvard, that growth is primarily about culture: that some societies have hard-working, enterprising people, and other countries do not. And that those countries with hard-working, enterprising cultures (the United States, much of Europe, Japan, much of Asia, and most recently, India) grow rapidly, while those countries without that culture (much of Africa and Latin America) grow much less rapidly or not at all (Landes, 1999).

We recognize that culture plays a role, but it is—and, indeed, cannot be—the sole factor explaining economic success. If it were, then why have so many Indians, Russians, and some other expatriates been so successful economically outside their home countries, while many others left behind struggle to support themselves and their families? It is not just "self-selection"—that is, expatriates are successful elsewhere because they are the most enterprising to begin with (as demonstrated by their willingness to risk it all by leaving their home countries). The countries they left behind have struggled because their institutions have impeded progress (even in India, the home of the "information technology outsourcing" revolution, where plenty of rules still drag down other parts of that economy).

Or what about the role of geography and the notion that in some countries near the equator the heat makes it impossible for individuals to work

hard and exposes them to disease, or that countries that are landlocked have excessive transportation costs and cannot easily trade with the rest of the world? Jeffrey Sachs has placed great emphasis on these factors as determining, or inhibiting, growth (Sachs, 2005). As with culture, there may something to this line of argument. But then there are the counterexamples. If being at the equator is the economic kiss of death, how then does one explain the spectacular economic success of Singapore or the somewhat less stellar but still impressive performance of Thailand? If being landlocked condemns a country to backwardness, how does one explain the remarkable economic record of Switzerland, which is so landlocked by mountains on all sides that it has used its unique geography in the past as a symbol of its neutrality?

And what about education or, as economists antiseptically label it, "human capital"? As we will discuss in later chapters, virtually every theoretical model and empirical test of economic growth assigns a major role to the presence of an educated workforce. We do not dispute the importance of some degree of education for growth but do not single it out as having a unique role for creating an entrepreneurial society or economy, for a simple reason: context matters. Before the Berlin Wall fell (and even since), the countries belonging to the former Soviet Union and many of the Eastern European countries boasted some of the most successful primary, secondary, and even higher-level educational systems in the world. But these systems were embedded in a political and economic atmosphere—socialism or communism—that was the very antithesis of entrepreneurship (admittedly, there was innovation, particularly in military technology and space exploration in the U.S.S.R., but these were the exceptions that prove the rule).

To be sure, an educated workforce can provide a huge boost to entrepreneurship when some or all of the other factors just listed are also present, within a capitalist setting. Highly educated individuals are more likely to come up with cutting-edge entrepreneurial businesses, especially in an increasingly high-tech world. In addition, countries where basic education is widespread can be vital for supplying the human capital that entrepreneurs can draw on to grow their ventures.

Finally, what about democracy? Is it not essential for growth, or as others have claimed, is some degree of autocracy first necessary to enable

countries to reach a certain level of development, after which democracy becomes more or less inevitable? These are hotly contested questions, and although the verdicts are still out, our view of the evidence, such as it is, is that democracy certainly can contribute to growth, especially in entrepreneurial economies, but is not essential for this to occur. The growth "miracles" of Southeast Asia, and more recently China, attest to the latter proposition. At the same time, the evidence does not support the view that autocracies are essential for growth; in fact, even among less developed countries, democracies grow faster than countries ruled by autocrats.

The list of "what abouts" certainly goes on, and we will not dwell on all possible permutations in this opening chapter. Suffice it to say that when we examine the various theories and empirical studies of growth in greater detail in chapter 3, we find them wanting, indeed, even crying out for something else. That "something else," we submit, consists of the four basic elements of the successful growth machine we have identified and will later elaborate.

Plan for the Rest of the Book

We flesh out the above propositions and others in subsequent chapters. In chapter 2 we will address the threshold question: why should countries, or their populations, care about economic growth in the first place? This is a seemingly obvious and innocuous question, but as we suggest in the chapter, a number of critiques of growth have been mounted in recent years. We rebut them, and more, in chapter 2.

In chapter 3 we will tackle the key question: what determines economic growth? We don't provide all the answers—after all, that is what the rest of the book is about, and yet neither we nor anyone else has reason to be sure of the answer. But in chapter 3, we outline what, up to now, economists interested in the growth process have theorized and tested. As we have already suggested, we believe the answer to the growth puzzle so far has hardly been fully answered.

In chapter 4, we begin to fill in what remains of the puzzle by advancing some very different views about what capitalism looks like. Since the Berlin Wall fell and communism pretty much has disappeared (except in a few countries), it is understandable that many assume that, at least with respect

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WHY ECONOMIC GROWTH MATTERS

We are interested in entrepreneurship because we hope to explain and ultimately contribute to facilitating economic growth, which is traditionally measured by the increase in a country's output of goods and services (what economists call gross domestic product or GDP). When each of the present authors was trained as an economist, the importance of economic growth was assumed to be self-evident. One of us studied the subject immediately after the Great Depression, when the entire thrust of teaching in the field understandably was how to stimulate growth.[1] After World War II and until the late 1960s and early 1970s, when the other two authors studied the subject, it was still widely assumed that the priority given to economic growth was not controversial and that it was even on a par with the ideals of motherhood and apple pie. Faster growth in the output of goods and services in an economy meant higher incomes for everyone (even though some people would, inevitably, earn more than others). Higher incomes would make it possible for more people to purchase, use, and enjoy more things (and services) in life. So how could anyone question the value of faster growth? In recent years, some observers have done just that, and now (and surprisingly, at least to economists) economic growth needs some defending.

Most people—those who are unemployed and want jobs, or who fear that they may lose their jobs, or who are poor and want the higher wages that faster growth will bring—have no doubts about the benefits of economic growth. But for reasons we hope will be clear shortly, there contin-

ues to be a need to persuade many who question the virtue of growth, and it is their criticisms that we will address here.

Before considering their specific critiques, it is useful to consider the big picture. At bottom, economic growth is essential not because humans are greedy or excessively materialistic, but because they want to better their lives. This is a natural aspiration and only with more economic output can more people live a more enjoyable and satisfying existence. Of course, economic growth is not the only goal in life. As economists will be the first to point out, there are always trade-offs: More work leaves less time for play and for family. More output often is accompanied by an increase in unwelcome side effects, such as pollution. But at the end of the day, the richer societies are, the more resources they will have to address the side effects of growth as well as the various maladies that shorten lives or make them less satisfying. Later in this chapter, we will provide some additional reasons why continued growth is especially important for both developing and developed countries in this century and beyond.

Are There Limits to Growth?

One line of skepticism about growth arises from individuals and groups who worry that as the world's population increases and economic growth continues, societies will use up scarce resources and, at the same time, degrade the environment. In the early 1970s, a group called the "Club of Rome" expressed such worries, fearing that eventually (and rather soon) the world would run out of energy and some commodities, so that growth *couldn't* continue at anything like the existing pace. Today, there are those who believe, for similar reasons, that growth *shouldn't* continue.

The doomsayers who projected that economic growth would come to a standstill were wrong. Since 1975, total world economic output has increased more than sevenfold.[2] On a per capita basis, world output is more than five times higher than it was thirty years ago. Growth in output, and therefore income, per person throughout the world advanced at a far more rapid pace (nearly ninefold) in the twentieth century than in any other century during the previous one thousand years (to the extent these things can be measured).[3] Per capita output continues to increase because firms

around the world continue to make more use of machines and information technology that enable workers to be more productive and because technology itself continues to advance, making it possible for consumers to use new products and services. There is good reason to hope that this process can and will continue, though there are some lurking dangers, including foolish actions by governments.

But should growth continue? What about the supplies of energy that will be depleted in the process or the pollution that will be generated as ever more things are produced and used? Curiously, economists who tend to be quite rational in their lives urge the worriers to have faith—faith that continued technological progress powered by market incentives will ease these concerns. As it turns out, however, economists' faith has roots in historical fact. In the early 1800s, Thomas R. Malthus famously predicted that the world's population would eventually starve or, at the least, live at a minimal level of subsistence because food production could not keep pace with the growth of population. Technological advances since that time have proved him wrong. Through better farming techniques, the invention of new farming equipment, and continuing advances in agricultural science (especially the recent "green revolution" led by genetic engineering), food production has increased much more rapidly than population, so much so that in "real terms" (after adjusting for inflation), the price of food is much lower today than it was two hundred years ago, or for that matter, even fifty years ago. Farmers, who once accounted for more than 50 percent of the population at the dawn of the twentieth century in the United States, now comprise less than 2 percent of population—and are able to grow far more food at the same time.

The same process of technological advance that undermined Malthus's dire predictions may be able to quiet the concerns of the modern-day Malthusians who worry about disappearing energy, although more active involvement by governments may be necessary to address concerns about global warming. As some sources of energy are depleted—fossil fuels, in particular—their prices will rise, setting in motion several developments that will keep economies from stagnating. For one thing, consumers will cut back on their demand for fossil fuels directly (taking fewer trips, carpooling, or even moving closer to work) or indirectly by buying things (cars, houses, and appliances) that are more energy-efficient. This oc-

curred after the first postwar "energy crisis" of 1973. Energy use as a percentage of GDP in the United States has been cut in half largely as a result of higher prices, and it will continue to drop if fossil fuel prices (adjusted for inflation) rise in the future. Equally important, if prices of fossil fuels increase, the backers of substitute forms of energy (nuclear power, fusion, geothermal, biomass, solar, and possibly other sources) will have stronger incentives to perfect their technologies so that they can be readily used instead.[4]

As for global warming, there is a consensus among scientists that the problem is real and growing. Indeed, some scientists attribute the intense hurricane activity that devastated the Gulf states and parts of Florida during the 2005 season to warmer waters due to global warming. At the same time, there is an emerging consensus among economists and policy makers around the world that the best way to curb the carbon emissions that are contributing to global warming is to employ a mixture of rules and market-like incentives, perhaps the most promising being the establishment of ceilings on pollution by allocating suitably restricted limits on unavoidable emissions by producers and allowing these rights to be traded in markets. Thus pollution can be capped and growth can nevertheless continue. The "cap and trade" approach, applied globally, was the linchpin of the Kyoto agreement reached in the late 1990s but not yet implemented (due in large part to opposition by the United States). Although political and practical problems may inhibit the adoption of cap and trade on a global scale, it may be feasible on both grounds to implement the idea on a national basis.[5]

Those who doubt whether economic growth can continue if resources are devoted to reducing pollution need only look to the U.S. experience—where both the air and water are far cleaner today than thirty years ago, even with a substantially higher production of goods.[6] If the same political energy that has so far fueled the "no growth" or "limits to growth" movements were channeled instead to persuading governments around the world to accept less socially damaging approaches, including a tradable emissions permit system, there is good reason to believe global warming concerns would be much attenuated.

Growth and Globalization

A second line of attack on growth, though not directly labeled as such, stems from the antiglobalization movement. Some of those who ob-

ject to the increasing economic integration among nations around the world—and who have mounted protests in various places around the globe to make their point—have done so out of the belief that even if this process of "globalization" enhances overall growth, it also contributes to rising economic inequality and even to poverty. Some critics of globalization have followed this reasoning to its logical conclusion, advocating higher barriers to trade, capital flows, and immigration as a way of reversing economic integration and thus ostensibly reducing inequality and poverty in the process, regardless of what it does to growth.

A look at the bare facts validates the concerns about inequality—at least among countries. Figure 1 displays the per capita real incomes (adjusted for price level differences and exchange rates between countries) of three groups of countries as of the year 2000: four "rich" economies (including

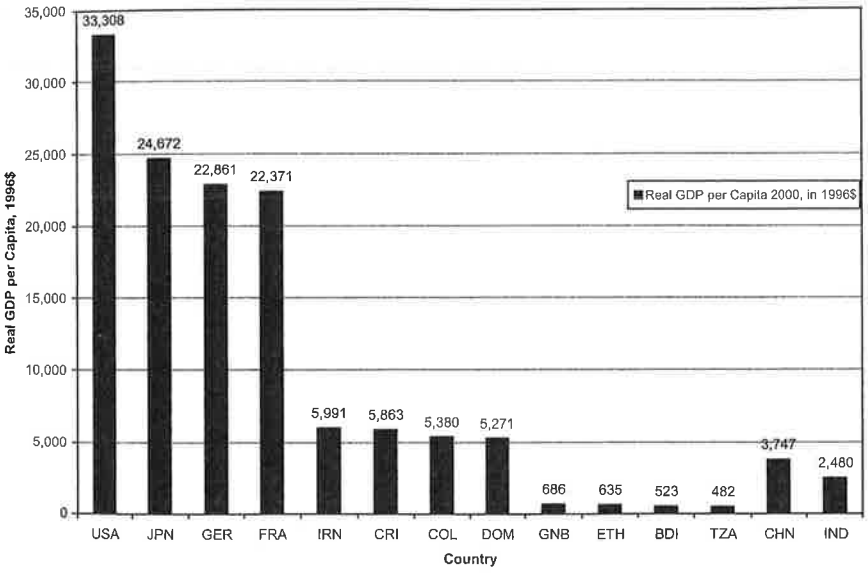


Figure 1. Real GDP per Capita for Advanced, Middle-, and Low-Income Countries, 2000, in Adjusted 1996 Constant Dollars. *Abbreviations:* USA=United States, JPN=Japan, GER=Germany, FRA=France, IRN=Iran, CRI=Costa Rica, COL=Colombia, DOM=Dominican Republic, GNB=Guinea-Bissau, ETH=Ethiopia, BDI=Burundi, TZA=Tanzania, CHN=China, IND=India. *Source:* Alan Heston, Robert Summers, and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002. Available at http://pwt.econ.upenn.edu/php_site/pwt61_form.php.

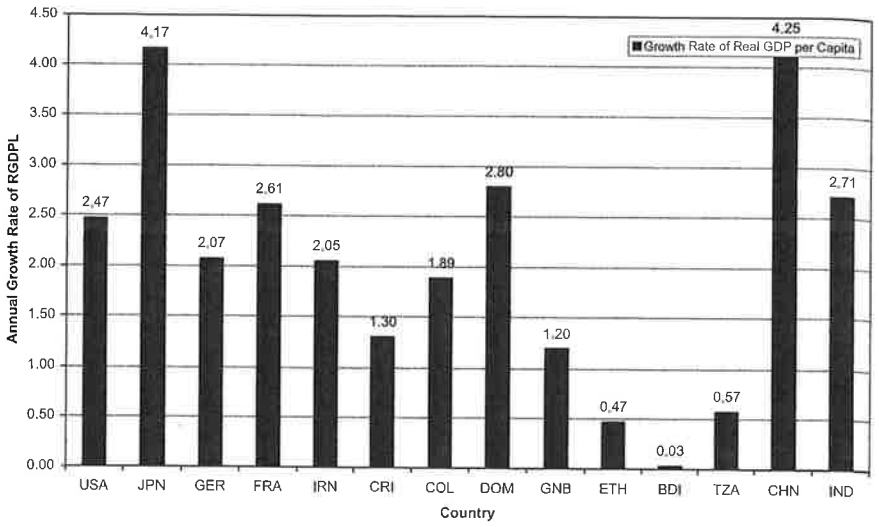
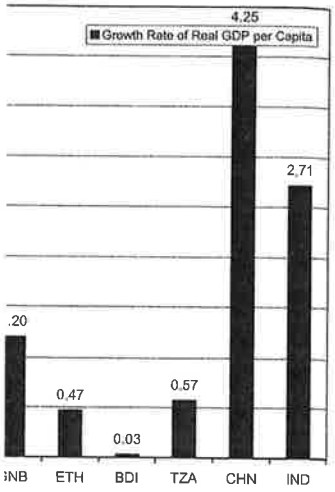


Figure 2. Annual Growth Rate of Real GDP for Advanced, Middle-, and Low-Income Countries, 1960–2000, in Adjusted 1996 Dollars. *Abbreviations:* USA=United States, JPN=Japan, GER=Germany, FRA=France, IRN=Iran, CRI=Costa Rica, COL=Colombia, DOM=Dominican Republic, GNB=Guinea-Bissau, ETH=Ethiopia, BDI=Burundi, TZA=Tanzania, CHN=China, IND=India. *Source:* Alan Heston, Robert Summers, and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002. Available at http://pwt.econ.upenn.edu/php_site/pwt61_form.php.

the United States), four "middle-income" countries, and four poor countries. The differences among the three groups are vast, with residents of the rich countries earning roughly five times what those living in the middle-income countries earn, and more than twenty-five times the average earnings of residents of the poor countries.

What is especially disturbing about these disparities in per capita incomes among countries, however, is that in the four decades from 1960 to 2000, they generally *grew,* implying that income inequality has become worse. This can be discerned from figure 2, which displays the growth rates in per capita incomes over this period. Although not all the differences in national growth rates are as clear as those shown in figure 2, a distinct pattern does emerge: on average, rich countries grew faster than those in the middle and even faster than those at the bottom. In other words, levels of income or output per capita are diverging rather than converging. Note



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that at this point, we are simply presenting facts, making no statements about whether and to what extent increased globalization has contributed to this trend or, as Martin Wolf has persuasively argued, has in fact ameliorated it (Wolf, 2004).

In subsequent chapters, we will discuss the continuing controversy over whether income disparities among countries inevitably must converge toward rich country levels of per capita income. But it is important at this point to distinguish differences in the average welfare of citizens among *countries* from differences in incomes of *all individuals* around the world, wherever they may reside. In particular, if one takes account of India and China, where roughly 40 percent of the world's population reside, income inequality among individuals appears to have narrowed over time due to the rapid income growth in heavily populated parts of those two countries (Bhalla, 2002).

Moreover, of particular relevance to the debate about globalization, both India and China have achieved rapid growth while opening themselves up to the rest of the world: trading more extensively and accepting more investment from rich countries. Openness to trade and investment, as we will discuss in later chapters, can be critical to facilitating entrepreneurship and, hence, growth. For now, it is essential to note only that growth and poverty reduction go hand in hand (Dollar and Kraay, 2002). Indeed, it is difficult to think of examples of countries where poverty has declined without economic growth. A rising tide truly does usually lift even the boats at the bottom. From 1978 to 2000, in particular, while the world population grew by 1.6 billion people, the number of people with incomes below $1 per day—the lowest threshold of poverty—declined by more than 300 million (Barro and Sala-i-Martin, 2004, 9).

But even if globalization did worsen inequality (as it may within certain countries, especially because it often disproportionately benefits the most-educated individuals who have skills or products to sell in a global marketplace), steps to slow down or reverse economic integration clearly would reduce growth and very likely lead to lower incomes and average standards of living around the world.[7] A simple thought experiment should demonstrate why. Imagine if residents in each of the fifty states of the United States were limited to doing business only with other residents of their states. Is there any serious question that total output, and therefore in-

comes, in such a "disunited" America would be lower than it is now, with Americans freely able to buy and sell goods and services, send money to and receive money from, and move to any part of the "united" states, rather than being limited to conducting business only with individuals and firms in a single state? Expanding the size of the market in which individuals and firms can do business enhances prosperity, enabling individuals and firms to specialize in what they do best, insights contributed more than two hundred years ago by Adam Smith and David Ricardo. This is just as true for the United States, as it is for other countries throughout the world.[8]

Growth and Happiness

A third critique of continued growth arises out of the oft-stated aphorism that "money cannot buy happiness." Of course there is plenty of truth to this. Religious leaders constantly remind us, for example, that spiritual health is more important than wealth. At a more mundane level, although the average American household clearly is better off financially today than before, many individuals may be no happier as a result. One obvious reason: With both parents working in many families, the constant struggle to do a good job at work and to spend "quality" (if not "quantity") time with their children makes many Americans feel as though they were on a treadmill. Cornell University economist Robert Frank adds another reason why many Americans may feel no happier, even though they have higher incomes. While most "consumption goods"—houses, cars, and clothes—may make individuals temporarily feel better, that effect is not likely to be permanent. After the "newness" of these items wears off, individuals tend to take them for granted. Moreover, when people look around and find that others have the same or better consumer goods as they do, they may eventually be less happy than they were before (Frank, 2004). Clearly it seems that *relative* wealth or income may be more important to a sense of well-being than absolute wealth or income (Graham and Pettinato, 2002).[9]

Still, economic growth may matter more than people may realize. What individuals report to interviewers in a survey will not necessarily capture the progress that people may take for granted but nonetheless objectively

makes them better off. For example, consider the fact that over the past several decades, average life expectancies around the world, even in most developing countries, have been rising.[10] This remarkable result has been made possible by more plentiful supplies of food and better health care, both of which are the products of economic growth. Or consider the significant gains that rich countries, such as the United States, have made over the past several decades in controlling pollution and enhancing the safety of a variety of products (especially dangerous ones, like automobiles). None of these developments would have been possible without growth in incomes that lead people to demand and afford cleaner and safer environments.

Respondents to surveys may not fully be aware of all of these facts when asked for immediate answers. Indeed, as journalist Gregg Easterbrook has noted, one of the "paradoxes of prosperity" is that many individuals in rich countries don't realize how good things really are (Easterbrook, 2003). Instead of assessing the benefits of growth by asking individuals to compare the way things are to the way they were, we believe it is more revealing if the question were asked prospectively—that is, if they would be happier if they had more income in the future, even if everyone else in their neighborhood, city, or country also enjoyed the same increase (whether in absolute or percentage terms). We suspect that not many individuals would question growth if put this way. We are especially confident that the roughly two billion people living on the equivalent of less than $2 a day throughout the developing world would have little trouble answering that they would feel better off.

GDP: Is That All There Is?

A fourth line argument, related to the one about growth and happiness, is that the growth of output as it is conventionally defined does not accurately represent the growth of human welfare. By definition, GDP counts only goods and services that are traded in the market or, if supplied by the government, have prices attached to them. GDP does not measure a whole series of activities that are not traded in the market but that nonetheless contribute to or detract from our overall sense of well-being, including: household activity, human health, selected activities of nonprofit

organizations (especially those relying on volunteer labor), and environmental conditions. By focusing exclusively only on what can be found in the market, citizens and policy makers come to have too narrow a view of what really counts in life. A 2006 report by the Organization for Economic Cooperation and Development adds that measures of gross output do not take account of its distribution among an economy's residents (or the degree of income equality or inequality) nor do they count the value of leisure time. Thus, depending on the value society attaches to income equality and leisure, for example, "adjusted" income per capita in some countries in Europe actually may be higher than in the United States (OECD, 2006).

We agree that GDP has its limits, as economists have long recognized. More than three decades ago, two prominent American economists—William Nordhaus and James Tobin of Yale University (the latter a winner of the Nobel Prize)—provided an alternative set of accounts that included various forms of nonmarket activity to arrive at a more comprehensive measure they called "Measured Economic Welfare" (Nordhaus and Tobin, 1972). More recently, a National Academy of Sciences panel has recommended that the federal statistical agencies develop a set of "satellite accounts" to measure these various nonmarket activities, as a way of supplementing the information conveyed by current measures of GDP (Abraham and Mackie, 2005).

None of this should detract from the fact that growth of market GDP is still something to be valued for two reasons. First, the goods and services that make up GDP are valuable to people in and of themselves since they enable people to enjoy a higher standard of living. Second, incomes and output most likely are positively correlated with a number of the nonmarket activities or outcomes that are not currently included in GDP. For example, as we have noted, as economies grow richer, their people can afford more health care and are able to invest in improving the environment (and, indeed, are likely to demand more of these nonmarket goods).

As for income equality or inequality, the value one places on this is inherently subjective, and thus measures of GDP "adjusted" for differences in the distribution of income should not be given undue weight. Nonetheless, extremes in either direction are undesirable. A society where all have the same incomes, for example, would provide no incentives for growth.

Conversely, societies where incomes are highly unequal are prone to political instability and backlashes that are also inimical to growth. No one knows where the happy medium lies, and like beauty, where that point is lies in the eyes of the beholder. The key is not so much how incomes are *currently* distributed but rather the ease or difficulty that individuals have of climbing to higher economic stations and thus to earning higher incomes. In short, it is *opportunity* that matters most—both for growth and for social and political stability.

There has been some debate in recent years, however, about the distribution of the gains from added productivity in the United States, in particular, whether workers as a whole have received their historic share (about two-thirds of the increase in output) or have suffered an erosion in that share. The debate arises from the apparent discrepancy between the faster rate of growth in productivity and that in real wages. But wage income alone does not account for benefits, specifically health insurance, that are included in the compensation of most American workers. Taking this into account, total compensation has been rising at roughly the same rate as productivity (Dew-Becker and Gordon, 2005). Of course, even this fact does not account for the long-run trend toward greater income inequality (pretax) in the United States among workers in different parts of the income distribution. This trend is widely known and accounts for the rising returns to education over time, reflecting increased employer demand for (relative to the supply of) skilled workers (Lazear, 2006).

Is Growth a Zero-Sum Game?

A key premise of this book is that economic growth is good not just for rich countries like the United States, but for all countries, since it is only through growth that people's living standards, whatever they may now be, can improve. But this premise does not seem to be as widely shared as we would like. In recent years, we have heard mounting objections among some political and opinion leaders in the United States who fear economic growth in other countries, especially in less developed countries—China and India, in particular.

To be sure, these fears typically are not expressed as directly as that. Instead, they are often couched as objections to the low labor costs in poorer

countries that enable them to provide goods and services more cheaply than can the rich countries like the United States. The suggested remedy to this situation, through one means or another, is for rich countries not to buy as much from poorer countries. To some ears, this may sound like "fairness," but those in the developing world see it as telling them they shouldn't be able to grow as fast as they can or as they would like. Is it true that economic growth somehow is a zero-sum game, meaning that every additional dollar that accrues to a poor country must come out of our own (Thurow, 1980)? If so, doesn't assisting other countries to grow arm our future economic enemies who will take away our jobs or reduce our wages? The answers to these questions are "no" and "no."[11]

Again, the fifty-state example should make the point. New Yorkers benefit when incomes in other states go up because richer citizens elsewhere provide a broader market for goods and services generated in New York. The same is true for each of the other states. The same logic applied after World War II when the United States launched the Marshall Plan to rebuild Europe and supplied extensive aid to Japan to get its economy back on its feet. As per capita incomes in these countries grew, more people could afford the products and services the American economy was able to produce and deliver. That America nonetheless ran trade deficits through much of the postwar era does not contradict this point; it only demonstrates that as Americans' incomes grew, their wants for foreign goods grew at a faster pace than U.S. exports. These new products, services, and production methods find their way to other parts of the world and thus can contribute to rising living standards there. In short, as economists would put it, there are "beneficial externalities" associated with entrepreneurship that crosses national boundaries.

In some minds, perhaps many, the rapid rise of China and India poses a different sort of problem. It is one thing for countries at lesser stages of economic development to advance on the strength of their lower labor costs, making essentially the same things as were once manufactured in rich countries. But there is growing evidence that in some spheres—information technology, biotechnology, and in certain types of electronic equipment—China, India, and their richer neighbors in Southeast Asia have moved beyond mere manufacture or service delivery into research and development, the highest value part of the so-called value chain. In-

deed, as we will discuss in chapter 8, some major U.S. corporations have expressed growing interest in supporting university research in these countries rather than in the United States—and not solely for reasons of cost, but because gaining access to and using the results of the research may be easier in these other locales. Should rich countries like the United States be worried about "losing" some of their R&D base to other countries?

In one sense, yes, and in another sense, no. On one hand, as R&D moves abroad, other countries stand to gain some of the profit that would have accrued to United States–based companies and their investors (although some of these may be foreign in any event). Furthermore, R&D success is likely to lead to other successes down the road. Scientists may move to locations where other cutting-edge researchers are located. Moreover, armed with the insights of their initial discoveries, innovators are likely to have a head start on the next wave of related innovations. The net effect of all this is that the countries that are host to the R&D breakthroughs grow more rapidly than they otherwise would, while countries that do not host such breakthroughs will grow somewhat more slowly.

On the other hand, as we will highlight in later chapters, innovation is an inherently "leaky" process. Even with well-enforced intellectual property rights, the vast majority of the profits from innovations accrue to society as a whole rather than the inventor or the initial entrepreneur. That is because innovations lead to new and cheaper products and services, which benefit all who purchase them, improving their standard of living. Thus, even if the "next big thing" should be invented in China or India, Americans and others in the world end up benefiting. That is how the world worked when Americans seemingly were inventing all the "next big things." It will be the way the world works in the future, even if some of those breakthroughs emerge in foreign locations.

There is yet another reason why it is in the economic interest of poor countries to grow more rapidly in the years ahead. As we will discuss shortly, and again in the last chapter, the United States and other rich economies will experience a wave of retiring baby boomers over the next several decades. Those retirees who have been lucky or fortunate enough to have saved for their retirement certainly are counting on the value of their financial assets (as well as their residences and other real estate) not to fall and ideally to continue rising at a rate faster than the growth of

their economies. This is unlikely to occur, however, unless investors from emerging markets have the wherewithal to buy the securities that the retirees certainly will be selling, since it is unlikely that the younger generations within the richer countries will have the incomes, and thus savings, to purchase these assets. But investors from abroad will not have the resources themselves unless their economies continue growing. For this reason, investors in all rich but aging economies have a strong economic interest in the continued growth of economies in the rest of the world.

We confine our argument about the benefits of global growth to economics, and not politics. But it could well be that certain countries might use their new-found wealth to enhance their offensive military capabilities and thus increase the chances of conflict. For example, as China's economy continues to grow, its people and its government may not give up on the dream to reunite the mainland with Taiwan. Under the wrong circumstances—in particular, if Taiwan acted too independently—China could move militarily to accomplish that objective. A richer China would be better positioned to finance such a military campaign. The same could be said for a richer India, Pakistan, or any other country in the world where grievances with neighbors are all too common.

Fortunately, economic growth also is accompanied by a countervailing force, which may moderate, though not necessarily eliminate, any impulses toward military action. As we will discuss in chapter 5, there is compelling evidence that as economies grow richer, their propensity to embrace democratic values and institutions is greater. In turn, as societies embrace democracy while also becoming wealthier, they have in the past been less likely to turn to military action to advance their interests. If true, then entrepreneurial capitalism, by advancing growth, may help to diffuse tendencies toward armed conflict in different parts of the world.[12]

Growth and the Demographics of Aging

There is an old saying that there are only two certain things in life: death and taxes. But one of these certainties—death—is getting pushed back, with advances in medical science and nutrition, both made possible by economic growth. As economies grow richer, however, other demographic trends are set in motion. Families have fewer children because they

have less need for them as breadwinners. Fewer children and longer life spans mean only one thing: over time, the average age of individuals in society increases. The aging of populations in advanced countries, some with fertility rates below replacement rates, has been known for some time. But what many people may not realize is that the average age in developing countries is rising as well. Indeed, as both the International Monetary Fund and the United Nations have reported, the entire world is aging, and the effects will be even more noticeable in the developing world than in countries that are already rich. Whereas nearly 60 percent of the world's elderly (those over sixty-five) live in developing countries today, that share is projected to increase to 80 percent by 2050 (IMF, 2004; United Nations, 2004).

So what does economic growth have to do with all this, other than helping to make it possible? The short answer is that while growth certainly helped contribute to the aging of the world, it is going to be desperately needed to help pay for the medical care and income support promised to the elderly. To be sure, this is a problem now confined primarily to rich countries, whose governments already have made these promises and have acted on them to a degree. But many developing countries have established similar, though less generous, systems of their own and, indeed, are being encouraged to do so by the World Bank.

The financing problem just for richer countries is enormous. Consider the United States, where the challenge is the least acute among developed economies. As shown in figure 3, in 2004, benefit payments under the United States Social Security and Medicare programs totaled roughly 5 percent of GDP, accounting for about a quarter of all federal spending (which, in turn, is about 20 percent of GDP) and roughly 30 percent of federal tax revenue. In 2010, the earliest baby boomers will begin retiring, a trend that will pick up speed as the years pass. As it does, the promised income and medical benefits will soar.

Thus, the Congressional Budget Office (CBO), the United States government's neutral and official government scorekeeper, has projected spending on these two programs, together with Medicaid (another entitlement program that supports health care for low-income individuals and families) to rise to 13 percent of GDP by 2025 and to 19 percent of GDP by 2050 (CBO, 2003). Compare these figures to the roughly 17 percent of

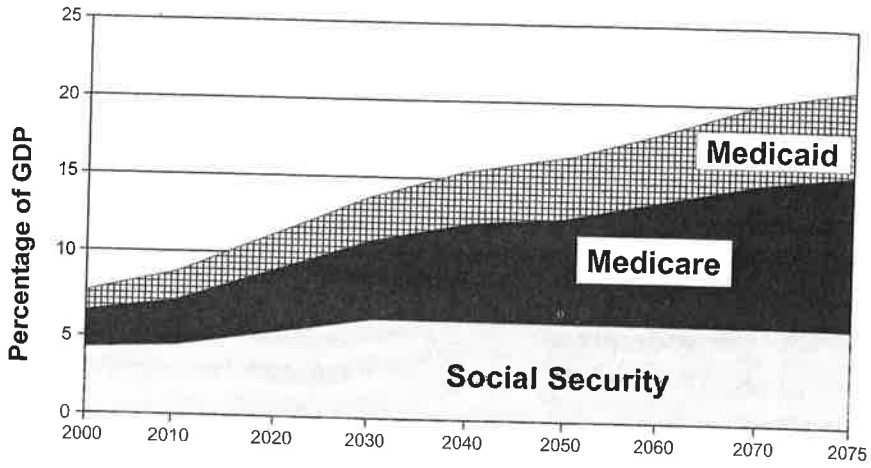
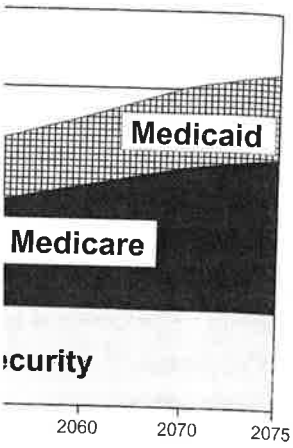


Figure 3. Social Security, Medicare, and Medicaid Expenses as a Percentage of GDP. *Source:* Testimony by Douglas Holtz-Eakin, director of the Congressional Budget Office, on the economic costs of long-term federal obligation, July 24, 2003. Available at http://www.cbo.gov/showdoc.cfm?index=4439&sequence=0.

GDP the federal government collected in taxes in 2004—the lowest share since 1960—or even the roughly 20 percent of GDP tax share that has prevailed in the United States for the past quarter century, and without major policy reforms, a fiscal disaster seems inevitable.

In our view, therefore, some combination of tax increases and budget cuts (especially in entitlements programs) eventually will be required to address this problem.[13] However politically painful these steps may be, they pale in comparison to the economic pain that the country would suffer if, at some point, investors fear they will *not* be taken and then refuse to buy the mounting federal debt required to finance our government except at much high interest rates, which could throw the U.S. economy (and other economies) into deep recession.

In any event, the magnitude of the required fiscal correction, and thus the political pain that decision makers must be prepared to absorb, will depend to a significant degree on how fast the economy grows. The Congressional Budget Office projections assume that output per worker will rise in the future at roughly 2 percent annually, which is a bit above the disappointing 1.5 percent rate of increase during the dark years of the 1973–93 period but considerably below the roughly 3 percent growth in annual



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labor productivity that the United States has achieved since then. Economists aren't very good at predicting the future rate of productivity growth since, at bottom, this requires projection of the future rate of innovation, which essentially is impossible to do with any accuracy. That is why organizations like the CBO, and most economists, when confronted with the need to make long-run projections adopt a technique called "reversion to the mean." This principle, which many stock market analysts employ, suggests that if the growth of any variable strays too far away from its historical average, it eventually will bounce back toward that average, though it may overshoot it. In the case of productivity growth, the long-run average for the United States since the mid-1900s is about 2 percent, so reversion to the mean implies that our future productivity growth, over the long run, will plausibly be somewhere in that neighborhood. Hence the CBO's long-run projection.

But it doesn't have to be that way. What if the economy changes in some fundamental way so that past history is not a good guide to the future? For example, productivity advanced at 2.5 percent annually from the end of World War II until 1973, when the first "oil shock" occurred. There followed the dismal 1.5 percent growth rate experience for the subsequent two decades before something kicked in, sending U.S. productivity growth soaring beyond even the fast pace of the first quarter-century after the war.

The point of this brief recitation of productivity facts is that economies are not stagnant. Things change, and when they do, history may well not be a guide to the future. Here is where growth comes in. What if the United States were to find a way to continue or even exceed the remarkable post-1993 productivity growth rate of 3 percent rather than settle down to the 2.1 percent projected by CBO? Over the next forty-five years, that nearly one-percentage-point annual difference would mean that by 2050 per capita output would be roughly 60 percent higher than the CBO has projected. With the GDP denominator that much larger, the ratio of Social Security and Medicare spending to GDP would be substantially lower. The decline in the spending ratio would be mitigated to some extent by the fact that, under current law, Social Security payments rise as real wages rise, and wages would increase roughly one percentage point faster if productivity grew that much more rapidly. But faster productivity growth

certainly would make Medicare spending more affordable, since wages and salaries of health care workers, which would also rise with higher productivity, account for only a portion of overall medical costs. Similar effects would follow if Europe and Japan somehow found a way to increase their rather anemic rates of productivity growth in the future.

In short, growth matters to aging societies because it makes it easier to afford government promises of support made to the elderly, among others. Aging, in turn, has two very different effects on the growth process. On the positive side, aging labor forces—up to a point—mean that the typical worker has more experience. More experienced workers, in turn, are more productive, so that as societies age, they should display faster productivity growth, other things being held constant.[14] But in aging societies, not everything can be held constant. As societies grow older, they are likely to have a lower proportion of young adults without families or children to support, and thus the cohort of individuals that are more likely to take the risks that lead to the formation and growth of high-impact enterprises will be smaller. After some point, aging societies are likely to be less entrepreneurial, in the sense of the term that we are using it in this book: developing and growing enterprises that have high-growth potential. True, many senior citizens or near retirees in the United States are jumping off the corporate ladder to start their own consulting operations or specialty stores, the traditional retirement pursuit of the elderly in Japanese societies. But, other things being equal, it is difficult for older individuals to have acquired the knowledge needed to come up with and commercialize the kinds of breakthrough technologies and services that drive economic growth. That is one of the reasons why, we will argue in chapter 7, countries like Japan and those in Western Europe face an even steeper uphill economic climb than the United States in financing the income and medical needs of their retiring populations in the future.

Economic Growth and Domestic Civility

Finally, economic growth is like a social lubricant that eases tensions while giving hope to populations. Societies with stagnant or, even worse, declining per capita incomes by definition cannot convince younger people that their economic fortunes will improve as they grow older. And without hope there is little or no entrepreneurial spirit to strive to change

the existing order or to improve one's own standard of living, let alone the living standards of neighborhoods, cities, or entire countries. In short, the lack of growth itself can become an obstacle, holding back economic progress, or even worse.

As Harvard University economist Ben Friedman has persuasively argued, slow growth, especially when coupled with widening inequality, can provide the environment that breeds distrust and often hate (Friedman, 2005). It is not an accident, he points out, that some of the worst periods of intolerance toward African Americans and immigrants in post–Civil War United States history (the late 1800s, the 1930s, 1970s, and early 1980s) occurred during periods of slow or negative growth. The worst-case example of this was, of course, the rise of Nazism in Germany following World War I, when that country was mired in both hyperinflation and stagnant growth (and eventually depression). In more recent times—for example, in the last decades of slow growth and high unemployment—Continental Europe has again flirted with anti-Semitism, while hosting a strong strain of anti-immigrant sentiment.

The reverse is much more likely to be true for economies that are growing. These have the good fortune to take advantage of a virtuous cycle, since the young can count on a better life, assuming they work hard to achieve it. Visitors to India or China or Ireland or Israel, for example, report a vibrancy and sense of excitement that one doesn't hear about in Western Europe, at the rich end, or much of Latin America or Africa, at the lower end of the world income distribution. Growth opens up opportunities, which in turn unleash not only hope but also the work ethic that helps turn opportunities into reality. Much of this same energy and optimism can be found in pockets of the United States—in high-technology clusters and in parts of some American cities. The challenge will be to maintain this combination of energy and hope in coming decades, when the United States also begins to deal with the many challenges of its retiring baby-boom generation.

Conclusion

The criticisms of growth have some validity but are fundamentally misplaced. Economic growth is and continues to be important, indeed, morally necessary if individuals and society care about improving the living

standards of peoples around the world. Michael Mandel, the chief economist for *Business Week*, has written about technology-driven growth in particular in a way that summarizes much of what we have tried to convey in this chapter:

> Such technology-driven growth is essential, I believe, if we are not to drown in our own problems. . . . Without breakthroughs in medical science, it won't be possible to supply the health care to a generation of aging Americans without bankrupting the young. Without breakthroughs in energy production and distribution, it won't be possible to bring Third World economies up to industrialized living standards without badly damaging the environment and stripping the world of natural resources. Without rapid economic growth powered by new technologies, it won't be possible to reduce poverty or ensure the next generation a better life than we have. (Mandel, 2004, xi–xii)

Just citing the hope for improvements in future technology begs the question: who comes up with it and, just as important, how does it get introduced into economies? As for the first question, economists generally agree that technological development is at least loosely tied to investment in the process of discovering new technologies, or research and development (R&D). But the more interesting question that so far has not been well studied, in our view, relates to the conditions under which new technology is introduced and used in economies. The answer to this puzzle turns very much on how an economic system is organized. We will address that critical question in chapter 4, after pausing in chapter 3 to survey what economists have concluded so far about what generates economic growth and why those efforts still leave room for further improvement through analysis and research.

3

WHAT DRIVES ECONOMIC GROWTH?

Modern economics as a separate academic discipline began with Adam Smith's *The Wealth of Nations,* whose central preoccupation was the question: what made economies rich? One of Smith's most important insights was that specialization, and therefore trade, within and across a country's borders was critical to growth. Individuals, he posited, would be far better off if each person specialized in what he or she did best and simply bought the things that other people could make more cheaply. In Smith's view, even if you were a jack-of-all-trades, it would be to your advantage to concentrate on the one or two things you did best because there always would be someone who could do the other things better. Thus, rather than grow your own food, build your own house, or make your own clothes, it would be better to specialize in one activity, or to work for someone else who did, and then buy the rest of what you needed from others. Smith was optimistic about future economic prospects as long as individuals and firms could freely trade with one another across as wide a geographic area as possible (as long as transportation costs did not offset the advantage of trading from afar).

Only a few decades later, Thomas Malthus did his best to turn that optimism around. Malthus is widely known, of course, for his infamous prediction that population would grow faster than the food supply, thereby leading to mass starvation and death. With this one forecast, Malthus did much to cement the reputation of economics as "the dismal science."

As the few statistics cited in the beginning of chapter 1 demonstrate,

Malthus was wrong. And, as we discussed in chapter 2, Malthus failed to take into account the continued advances in the technology of food production that have made it possible to feed more and more people with the same amount of (or even less) land and far fewer people engaged in the production of food. Nonetheless, one could excuse the roughly two billion people in the world who today earn less than $2 per dollars a day for believing that Malthus was right to be so pessimistic. For this reason alone, one would think that economists would have been consistently interested in why some countries grow faster than others, as well as why individual countries grow faster or slower in different time periods. But after Malthus, interest in the topic of economic growth declined among economists and did not pick up again until the era of the Great Depression, when economies around the world not only were *not* growing but were actually contracting at historically unprecedented rates.

The renowned British economist John Maynard Keynes supplied the solution to the problem at that time. Keynes argued that the classical remedy—waiting for high and rising rates of unemployment to drive wages down to a level where it would be profitable for business firms to begin hiring workers again—would not work, or that it would take so long as to be practically useless. For one thing, there was a downward rigidity to wages; workers who still had jobs resisted efforts by employers to lower wages simply to create new jobs. Equally if not more serious, firms would have little or no interest in hiring any more workers—even at lower wages—without confidence that whatever goods and services they produced or delivered actually would be bought by consumers or other firms. In short, Keynes's diagnosis of the Depression was that it was caused by insufficient demand for goods and services and could not be cured any time soon by waiting for wages and prices to fall.

A major economic field of study—macroeconomics—was born out of this basic insight. Associated with it was a set of straightforward economic prescriptions. If the private sector was generating too little demand, then government needed to come to the rescue, either by cutting taxes or increasing spending, or both. In other words, when the economy is weak, government deficits can help jump-start growth—but again, from the demand side of the economy. Conversely, if private sector demand growth

was too strong, so strong that it was pushing up against the limited capacity of the economy to produce goods and services and thereby causing prices and wages to rise, then one appropriate policy response would be tighter fiscal policy, higher taxes and/or cuts in government spending. This latter problem of inflation would not become evident in U.S. experience until many years after World War II, but it was anticipated in Keynes's thinking and, indeed, was the corollary of one of his prescriptions for getting an economy out of a recession or a depression (which is, in essence, a severe and prolonged recession).

Keynes's emphasis on government responsibility for managing the economy—keeping it propped up when private sector demand was weak and dampening it when private sector demand was too strong—has survived him. Although some economists have since questioned the ability or wisdom of governmental attempts to smooth out economic fluctuations, the fact remains that in virtually all capitalist economies, macroeconomic policy management remains a central job of government. Understandably, therefore, to the average investor (and, indeed, the average citizen) economic growth is largely or only a demand-side phenomenon, driven by the growth in private sector and government demand for goods and services.

But although demand is certainly important, particularly in the short run, it cannot explain growth in the *long run*. Like any machine, the economy at any given point in time has a certain maximum capacity. Over the long run, economic growth is about the growth in that capacity, or what economists often call "potential output," that is, the amount of goods and services the economy could produce if all its resources, people, and machines were fully utilized. In the 1980s, this focus on potential output was popularized under the rubric of "supply-side" economics and addressed the role that tax cuts play—or were alleged to play—in stimulating growth in economic capacity by encouraging individuals to work harder and to save more.

We will not wade into the controversy that continues to this day about how important taxes are in this process. The important point for our purposes is that supply-side economics was not new. A number of economists had theorized in previous decades about what determines growth of potential output. In this chapter, we want to review briefly what insights they

had, then turn to recent empirical studies of growth, and finally conclude with some thoughts about what we believe has been missing from these efforts to understand the process of economic growth.

Explaining Economic Growth: The Theory

In one sense, understanding how economies grow is like understanding how to make a cake: one must simply find a recipe. Recipes for making a cake include some basic ingredients (sugar, flour, leavening, and so on), some labor (measured in minutes or hours), and some equipment (a mixer and an oven). For economies, there are as many recipes as products and services, but typically all of them require essentially the same three ingredients: raw materials, labor, and machines (also called physical capital).

Actually, there is a fourth ingredient for both cakes and economies: technological change. Just as the mixers and ovens today are more efficient and cook more evenly than those of yesteryear, technological advances in whole economies lead to new products and services that are more desirable than those already on the market, as well as to more efficient ways of generating and delivering all products and services, whether existing or new.

In chapter 1, we boiled down the recipes for economic growth into two broad categories, which we labeled "growth by brute force" and "smart growth." By brute force, we meant the addition of more inputs—more labor and more capital that will lead to more output, although more capital alone will substantially raise output per worker. Yet one of the basic tenets of economics is that there are diminishing returns associated with the addition of any one factor of production. For example, with a given labor force, adding more and more machines will produce more output, but at a steadily declining rate. So although raising the share of output an economy devotes to both saving and investment can lead to higher growth for a while by providing more plant and machinery, it cannot do so in the long run. Put another way, in the long run, more investment can raise the level of total output but not its growth rate. This is one of many insights of one of the founding fathers of modern growth theory, MIT professor Robert

Solow (1956), and of another growth model published at the same time by Trevor Swan (1956).

Our second category—smart growth, that is, technological advance—can rescue an economy from diminishing returns. Steadily equipping any given labor force with better machines or equipment, such as personal computers instead of typewriters, can raise both the level and growth rate of output. Indeed, a central contribution of Solow's early work on growth theory (for which he was eventually awarded the Nobel Prize) is that technological advance (or increases in total factor productivity [TFP]) is the most important source of growth. Solow reached this finding for the United States using U.S. economic data through the 1950s and estimating an equation linking output to measures of capital and labor (Solow, 1957).[1] Since the estimated equation explained only about 12.5 percent of the variation in output, Solow attributed the leftover, residual variance to technological change. Subsequent work by the late Edward Denison, for the Committee for Economic Development and later for the Brookings Institution, reached similar conclusions through a somewhat different procedure—growth accounting—which apportions out growth to a number of possible causes (Denison, 1962 and 1974). Other economists have since come to a similar conclusion, that technological change is a key driver of growth (Easterly and Levine, 2001).

The theoretical growth models constructed by Solow, Swan, and others since are shorthand ways of expressing in mathematical terms the relation between certain input variables—labor, capital, and technological advance—and the growth in the output of goods and services. Although abstract, such models can provide useful insights. For example, in one mathematical form, the models imply that responsiveness of output to changes in labor or capital (what economists call elasticity) is equal to the respective shares of labor and capital in overall output. Roughly speaking, therefore, since workers' incomes typically account for roughly two-thirds of output in most capitalist economies, a one-percentage-point increase in the labor force (from some combination of population growth, immigration, and increases in the participation rate of individuals wanting to work) would, in this model, lead to a 0.67 percent increase in output.[2]

But even the best mathematical models have their limits, and the post-

war growth models were no exception. In the basic Solow-Swan model, for example, technological change is considered to be exogenous—something that happens with some combination of serendipity and policies aimed at promoting it (for example, government spending on basic research or legal protection of intellectual property rights). As we discuss below, the statistical studies of economic growth that have been performed over roughly the last two decades are largely aimed at attempting to unravel the mystery of technological change, or what many economists call the Solow residual. Why does the pace of innovation speed up in some periods and in some societies, and why does it slow down at other times and in other places? To be able to answer these basic questions is, at bottom, to be able to explain what can speed up or retard economic growth itself.

A growing number of economists have wrestled with these questions over the past several decades. Most have followed in the model-building and testing tradition pioneered by Solow; we will discuss their efforts in the next section. A few others, however, have taken an entirely different and nonmathematical path, one that stresses the importance of institutions, that is, the rule of law and informal norms that ensure that productive economic behavior will be rewarded. The leader of this institutionalist school of growth is another Nobel Prize winner, Douglass North, although others have contributed to the field.[3]

Economists who stress the importance of institutions typically point to the enforcement of rights to property (both physical and intellectual), contracts, and limited liability for investors in companies as being among the most important of these rules. Institutions take much time to develop, however, and generally cannot be copied or transplanted wholesale from some societies where they seem to work well into other societies that seem to be sorely in need of them. Instead, the institutions work most effectively, if at all, if they are home-grown. This can be frustrating to policy makers, whose time horizons are typically measured in years to the next election, not in decades—which may explain why the somewhat autocratic leaders bent on achieving economic reform (notably those in Korea and Singapore) have been so successful. The long time lags inherent in the development of institutions also frustrate the ability of economists to test their importance empirically, for lack of available data. But just because the contribution of these institutions cannot easily be validated by standard

statistical tests does not mean they are unimportant. On the contrary, economists and policy makers who ignore the importance of institutions in economic growth run the risk of committing the proverbial lamppost fallacy: looking for one's lost money under a lamppost because that is where there is light, not necessarily because that is where the money was lost.

As readers will see in subsequent chapters, our own thinking on the subject of economic growth has been strongly influenced by the institutionalist school of economic growth. This also explains our mode of argument, which is heavily historical, logical, and even anecdotal rather than statistical. We acknowledge the limitations of our work, which can be fairly described as informed guesswork. Some of our prospective critics (if there are any!) may emphasize the guesswork aspect of our work, but we hope most readers will recognize that our analysis is informed by a substantial body of facts.

Explaining Economic Growth: The Empirical Evidence

For roughly two hundred years, from the time of Adam Smith up through the contributions of Solow and Denison, the topic of economic growth was largely the stuff of abstract theorizing. All this has changed over roughly the past two decades for a simple reason: the historical data that economists need to run standard statistical tests have been generated and made available by several economists who pioneered this unglamorous, but very important, aspect of the field. Accordingly, growth theory has been elaborated and subjected to a wide number of statistical tests by various economists in recent years, the essence of which we will review now.

Still, even with the best of data—and we will argue shortly that the data here have their limits—economists, like other social scientists, face obstacles that their counterparts in the physical sciences (physics, chemistry, and biology, for example) do not. Physical scientists generally are able to test their theories or hypotheses by running experiments, in which they can test one population that has been subjected to some intervention (such as a drug or a procedure) against a control group to see if that intervention makes the difference that theory suggests. These experiments often generate results very quickly, in a matter of days or months. In the case of highly

sophisticated particle accelerators, physicists get results in literally a flash of a second (although it may take a bit longer to analyze the results of smashing atoms at the speed of light). Astrophysicists can also look backward—over many millions of years—by looking into space through increasingly powerful telescopes or probes launched into space to take advantage of the speed of light to find out what certain objects looked like or how they behaved many millions of years ago.

Economists do not have these luxuries for several reasons. For one thing, economists cannot run controlled experiments, with results observable only after a substantial delay, with entire economies, although in some rare cases, social scientists can conduct more modest experiments on selected populations (giving different groups various economic incentives or rewards for certain types of behavior, or providing groups of students different curricula or other educational interventions, for example).[4] But no government will allow its country to serve as a control group or a guinea pig for a study on what encourages or inhibits economic growth, especially given the long time lags involved in collecting and analyzing sufficient data for economists to draw definitive conclusions. If some policy has at least a reasonable chance of raising growth, governments and the people they serve will or should want to implement it right away, not wait to find out many years later whether it might work (although interest groups in societies that might be hurt by growth-oriented policies, which inevitably create disruption, may be successful in resisting their adoption).

Accordingly, economists are almost always looking backward in an effort to develop policies for the future. They do this by applying statistical techniques to bodies of historical data to sort out one or more variables whose patterns might explain growth. If economists can do that with some grounds for confidence in the results, then they can offer prescriptions to government leaders with at least some hope that what has worked in the past has a reasonable chance of working in the future.

For example, in the case of economic growth, economists seek to find out which ones of some set of "independent variables"—such as capital, labor, and various other factors they believe might contribute to technological change—drive economic growth (which is the "dependent variable," typically measured by per capita GDP or some variable designed to measure innovation or technological change directly). Once economists

know, or believe they know, what factors have been most important in stimulating innovation in the past (ideally, factors over which governments have direct control, like spending on research and development, tax rates on income or sales, or openness to foreign trade and investment, for example), then they have some basis for proffering advice to political leaders that has some grounding in facts, not simply theory or, worse, political or personal bias.

Yet even in this endeavor, economic analysis has its limits. One problem is that in prescribing policies that have worked in the past, economists—and the politicians who listen to them—implicitly are assuming that the economies to which they are applying these policies will continue to behave or operate in the future in fundamentally the same way as in the past, or at least in similar fashion. This is equivalent to saying that the individuals and firms who make up these economies will act in the future much as they have in the past. While this is a plausible assumption, reality may intrude in some way or another, and this possibility at the very least raises questions about that assumption. This is especially true where some event—like a war, a major depression, or a sharp change in political or economic systems (the sudden transition from socialism to some form of capitalism in the former Soviet Union and Eastern Europe, for example)—has marked a sharp break between two historical periods. In such cases, people, firms, and even governments may behave very differently after the break than before.

A second limitation is that the statistical techniques that economists typically use (such as multivariate regression analysis) have their own shortcomings. For one thing, the results they generate are only as useful as the data to which they were applied, a limitation about which we have more to say in the following section. For another, statistical techniques often do not generate consistent or even clear answers, which is a limitation that we believe plagues the statistical work on growth in particular. There is always the problem of omitted variables or influences that really matter but which have not been included in the statistical tests, sometimes unintentionally or, more often, because the data to measure those influences do not exist or are highly imperfect.

And then there is the nagging problem of how to interpret the statistical results. Strictly speaking, regression analysis—which seeks to find the mathe-

matical formula that best "fits" the behavior of some independent variables to the behavior of another dependent variable—usually generates at most what economists or statisticians call correlation. One variable is correlated with another if it moves in roughly the same direction as the other. For example, rainfall patterns are generally correlated with agricultural yields. Or the frequency of sunspots may be correlated with the ups and downs in the stock market. But correlation is not causation. The fact that two variables are highly correlated does not necessarily mean that one causes the other. The hypothetical sunspot example should be proof of that.

This distinction between correlation and causation is critical in social science, and in economics in particular, since political leaders who adopt a policy that economists recommend will generally assume that if they take that step they will get the positive results they desire—that adoption of a policy will cause some desirable outcome, like faster economic growth, to occur. But the regression results on which the policy recommendations rest may not justify such causal inferences. Or even if they do, when the policy is adopted, other forces—within or outside the economy (such as the weather)—may interfere with the experiment. Economists, politicians, and pundits will then debate for years thereafter about what truly caused what. The continuing debate in the United States over the impact of government budget deficits is one example of how controversies can seemingly go unresolved for years.

With these many caveats in mind, we now briefly describe the various statistical tests economists have deployed to unlock the puzzle of growth. As we have already suggested, these tests rest on the availability of statistical data on levels of output and other variables in different countries that might contribute to economic growth. Why different countries? Because the reliability or "confidence" of statistical tests improves as the quantity of data analyzed increases, especially if one wants to test the presence and magnitude and influence of many variables at the same time. As statisticians like to say, the more data they have relative to the number of variables tested, the more "degrees of freedom" they have. When statistical tests are limited to one country, the statistician only has data for that country for a given number of variables of interest over as long a period as they have been collected. In the United States, this is probably since 1950, and be-

cause the measures we are interested in are released annually, the data base can cover about fifty-five years or data points, at maximum. For other countries, the time series—the available set of statistics—may be even shorter. But when time series data for different countries are pooled together, the number of observations is greatly magnified and so is the power of the statistical tests, at least in principle.

These fine points of statistical testing were not an issue in the first generation of post-Solow statistical tests of growth, which used the data series on output, output per worker (or work-hour), and output per capita that were compiled by Angus Maddison (1982), who is one of the leading figures in the highly specialized field of cross-country data collection, and Matthews, Feinstein, and Odling-Smee (1982). The tests asked a seemingly simple question: have standards of living, as measured by productivity (output per hour of work) or output per capita in different countries, converged over time? In other words, do advances in leading countries spill over to a set of follower countries, through exports of goods, capital, and ideas from the advanced guard to the followers? And does this spillover and imitation process happen in such a way that the follower countries catch up to the leaders by growing more rapidly for a time (perhaps by investing and saving greater fractions of their output while adopting the leaders' technology)?

Several early studies of different groups of countries confirmed that this had indeed happened. Matthews and colleagues found it to be the case over the 1870–1973 period for seven countries that were industrialized by the early 1970s (Matthews et al., 1982). One of the authors of the present volume reached a similar finding, using Maddison's data, for a larger sixteen-country group over a slightly longer period, 1870–1979 (Baumol, 1986), but found that convergence had not occurred among the much larger set of countries for which the requisite data were provided by Summers and Heston (1991). That is, for the converging countries one could explain the growth rate of their productivity over a little longer than a century almost entirely by knowing only one thing: their initial level of productivity in 1870. If a country started out far behind the productivity leader (which, in 1870, was Australia), it grew much more rapidly than if its productivity level was already at or close to the frontier. This simple proposition, that the further behind the leader a country was in 1870, the faster

it grew later, explained the very rapid growth of Japan, Sweden, France, and Germany over this long period, and the relatively slower growth of the United Kingdom and the leader itself, Australia.

Yet even the author of one of these studies cautioned that too much should not be read into this apparent finding of convergence, noting that the 1870 productivity levels were measured with considerable error and that Maddison constructed them using a method of backward extrapolation that would have biased the finding toward convergence (Baumol, 1986, 1076). Baumol could have added that the 100+ years covered by the data series included two world wars, and that after World War II, in particular, one of the countries in the data set (the United States) provided ample financial and technical assistance to both Europe and Japan that should have enabled them to catch up to U.S. productivity levels after the war.

Thus, a more interesting question is whether, since World War II, convergence has occurred among a larger group of countries, including many that were once or still are less developed. Baumol (1986) used a data set of per capita incomes (which provide a rough approximation to productivity data) compiled by University of Pennsylvania professors Robert Summers and Alan Heston for that larger group of countries (these statistics have since become the data set of choice of a large body of researchers).[5] Unlike a similar set of statistics assembled by the World Bank at that time, the Summers and Heston data for output in different countries are adjusted for differences in the relative purchasing power of currencies, not just for differences in exchange rates between countries. This distinction is very important because the prices of the same commodities or services may be very different in different countries. Measures of output that do not take purchasing power differences into account do not capture the true disparities in standards of living among countries.

When Baumol analyzed the Summers-Heston data for seventy-two countries over the 1950–80 period, he found a very different set of results from those he had reported for the narrower set of industrialized countries over a previous longer period: for the entire group of countries, convergence had essentially disappeared. Indeed, there was even a mild positive relationship between a country's initial level of productivity and its subsequent growth: that is, the countries that were richer to begin with tended to grow a bit faster than other countries. Baumol did find, however, various country clusters where convergence seemed to take place within (but

apparently not across) those groups, between 1950 and 1980, among the (then) centrally planned economies (the Soviet Union, China, and Eastern Europe) and again among the industrialized countries. This convergence clustering did not appear to take place within developing economies as a whole, although we know from subsequent experience that at least one group of developing countries, notably those in Southeast Asia, has displayed rapid convergence among themselves and relative to the world's leading countries.

Baumol's finding of a lack of overall convergence in the postwar era through 1980 has continued to hold up. Figure 4 displays the growth rates in per capita income over the 1980–2000 period, together with initial per capita incomes for 106 countries in a more recent version of the Summers-Heston data set (with coauthor Bettina Aten). The figure clearly fails to support the convergence conjecture (the tendency for initially poorer countries to grow more rapidly than countries with initially higher incomes, as catch up would require). Indeed, if anything, simple visual in-

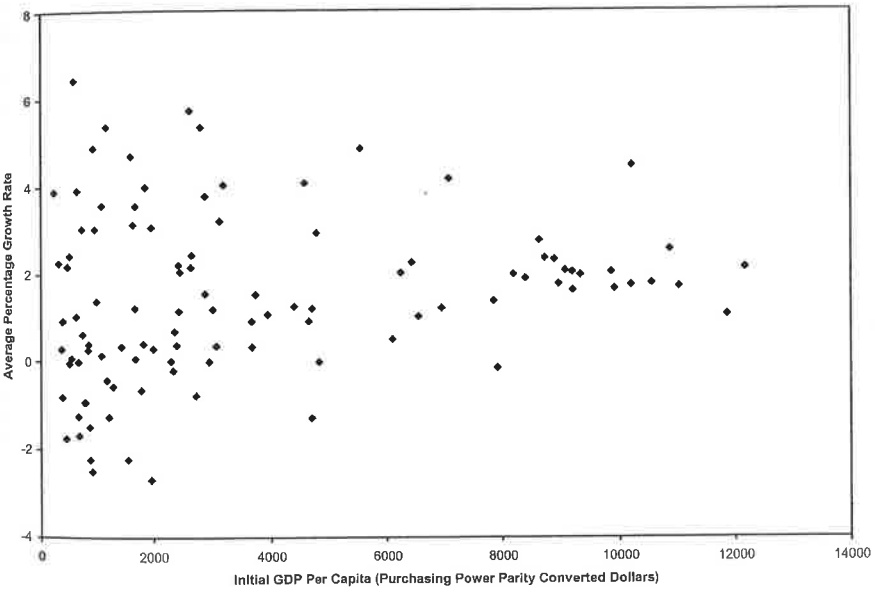

Figure 4. Cross-Country Initial GDP per Capita vs. Average Growth Rates, 1980–2000. *Source:* Alan Heston, Robert Summers, and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002 (106 observations: countries having complete data set). Available at http://pwt.econ.upenn.edu/php_site/pwt61_form.php.

spection of figure 4 suggests that initially richer countries may have grown faster than initially poor countries, a result consistent with figure 1 in chapter 2.

If countries are not converging in their standards of living, then what explains the continuing economic differences across countries? Attempts to answer this simple, but vital, question have spawned a separate industry within the economics profession. These research efforts would not be possible, of course, without the Summers-Heston-Aten data, which contain information only on the variables to be explained—the levels and growth rates of output (per capita or per worker or per work hour). A variety of data sources have since arisen for variables that might "do the explaining," such as measures of physical and human capital (labor force and education levels), institutional variables (law and corruption, for example), international trade, financial indicators, government and private investment in research and development, and measures of climate and geography provided by such organizations as the World Bank, the United Nations, and individual researchers.

The search for answers to the growth puzzle—and, specifically, the causes of the variation in the Solow residual (the rate of technological advance)—has engaged some of the most distinguished figures in economics, including two Nobel Prize winners (Stanford University's Kenneth Arrow and Robert Lucas of the University of Chicago), as well as many leading lights in the profession (such as Robert Barro, Greg Mankiw, Andrei Shleifer, and Edward Glaeser of Harvard University; Jeffrey Sachs and Xavier Sala-i-Martin of Columbia University; Stanford University's Paul Romer; Barry Bosworth and Susan Collins from the Brookings Institution; Yale University's William Nordhaus; Ross Levine from the University of Minnesota; Steven Durlauf from the University of Wisconsin; Elhanan Helpman of Harvard and Tel Aviv Universities; and William Easterly of New York University, among others). It is difficult (if not impossible) to summarize all of this work in a short space, but certain broad generalizations are possible. (Readers who want a more thorough guide to this research, and indeed to the evolution of the discipline of economics in general, are strongly encouraged to read Helpman, 2004, and Warsh, 2006.)

First, many of the economists who have conducted these studies now believe that if the right model of growth can be identified, it will show that

there is a fundamental dynamic toward conditional convergence. That is, if one controls for the right variables, it remains true that countries with low initial levels of productivity will have faster growth in productivity and economic output than richer countries. Of course, this conditional convergence process may occur slowly—or rapidly—depending on one's patience or expectations. Some of the cross-country statistical tests suggest that on average throughout the world, the gap between the richest and poorest countries closes at the rate of about 2 percent annually.[6] At this rate, it takes about a generation (thirty-six years) for a lagging economy to close half the gap between its per capita income and that of the leading economies. Those looking for miraculous turnarounds in a short span of time will be disappointed by this figure. But for others, the prospect for closing this much of any income gap in just a generation may seem remarkable.

Second, despite the substantial statistical investigations of growth that have been undertaken over the past two decades, economists who believe that the statistical work has helped to unlock the growth puzzle (as we will note shortly, this includes most, but not all, economists who pursued this line of work) still fall broadly into two groups. In one camp are those whose views adhere closely to the assumption built into the initial Solow-Swan growth model: that technological progress is primarily determined by forces—such as climate (which affects the rates of disease), geographic location (which determines costs of transportation and thus propensity to trade), and institutions (which are man-made but may take decades, if not centuries, to change)—that are outside the economic system and over which policy makers have little or no immediate control (see Bosworth and Collins, 2003, and Frankel, 2003). To this list some add culture, which is difficult to incorporate in formal statistical tests, but which some economic historians argue is the dominant driving force behind growth, a subject we will explore further in chapter 5.

In a second camp are economists who contend that the statistical studies lend support for the view that active policy intervention, in the short to intermediate run, can accelerate the growth of either or both labor productivity (output per worker or hour of work) or technological advance (measured by additions to output that arise even if labor and capital investment are held constant). Growth-enhancing policies can include governmental decisions to open up an economy to more trade and foreign in-

vestment, to support more research and development (through direct spending or tax incentives), to increase human capital by broadening the availability of primary and secondary education, and to conduct sound macroeconomic policies (avoiding consistent and large budget deficits or inflationary monetary policies). At its core, economists who fall into this second camp are more optimistic about the ability of governments to encourage more rapid improvements in living standards than what might otherwise occur naturally.

In the technical language that economists often use, economists in this second camp are suggesting that technological advance is endogenous, that is, it is determined by forces within the economic system itself rather than such exogenous factors outside the system as climate and geography. Much of the intellectual impetus for this way of looking at growth was provided in the 1980s through the work of Paul Romer, then at the University of Chicago and currently at Stanford (Romer, 1986).[7] Romer (and others who followed in his wake, including Robert Lucas and William Nordhaus) built on the earlier insights of Kenneth Arrow (1962) and Eytan Sheshinski (1967), who believed that the ideas that underpin technological advance are the unintended by-products of investment in new equipment that spilled over and thus benefited the rest of the economy. In this way, more investment would lead to more technological advance, suggesting that the latter somehow depended on the former.

One unspoken policy implication of this view that investment generates beneficial spillovers is that governments do indeed have a potentially important role to play in encouraging growth. To the extent that governments can stimulate investment, through tax incentives in particular, and also to the extent that they can encourage more domestic saving, which should enlarge the pool of funds available for financing investment (thus bringing down its cost), government can enhance the long-run prospects for growth. This implication sharply departs from the investment pessimism of the Solow-Swan growth model, which implies that additional investment eventually stops adding to growth because of diminishing returns. But if investment can actually enhance technological advance, this pessimism may be misplaced.

In his modeling, Romer went one step further, observing that technological advances often were not simply by-products, but were the objects

of economic activity itself—the products of deliberate investments of time and money by individuals and firms seeking to improve on what already exists and ultimately to commercialize any successful results. In this sense, business firms' investment in knowledge creation is analogous to their investment in new equipment that promises to make employees more productive. But unlike investment in a new machine, which has more or less predictable productivity-enhancing consequences, investment in knowledge discovery (and, if successful, its subsequent commercialization) is fraught with uncertainty. It is not surprising, therefore, that the statistical work that has gone into trying to explain the sources of technological advance has come up with varied answers, and some controversy over certain variables (such as openness to foreign trade) still continues.

One other policy implication stands out from Romer's work, however: that technological advance is not likely to occur, at least in economies at the frontier where imitation is not an option, unless those who undertake it are assured of some reward. Hence the importance of imperfect competition, or something other than the perfectly competitive ideal where so many firms are making an identical product that they compete away any excess profits. If some extraordinary profits are not available to the individuals or firms who leap into the unknown, taking the risks to develop and commercialize something new, then technological advance would not occur. That is why economists typically defend the importance of an effective system of intellectual property rights that confers monopoly status on innovators for some limited period of time, or why market structures should not be perfectly competitive in dynamic industries, at least in the short to intermediate run. Continuing technological advance, however, competes away any short-run profits so that over the long run they disappear.[8] We draw on these key insights in our discussion of what is essential to entrepreneurial capitalism in subsequent chapters.

Third, there seems to be some rough consensus among economists in both camps that institutions—such as well-enforced property rights and the absence of corruption—are important to growth. But debate still continues over whether Anglo-Saxon or so-called civil code legal systems are more effective in advancing growth.[9] The key challenge with respect to institutions is how best to create them. Must countries wait decades, or even centuries, for institutions to evolve naturally? An open question is whether

the right institutions can be manufactured or transplanted in short periods of time.

Fourth, included implicitly if not explicitly in the view that institutions matter is the rough consensus that one of those institutions is the development of human capital, which is the steady improvement in the skills of the labor force. In their empirical work, economists have typically measured human capital by years of education, although they admittedly recognize this to be an imperfect proxy for skills. A number of statistically based studies of growth find a strong link between human capital measured in this fashion and economic growth.[10] That link can arise through two channels. A more educated workforce has a larger effective labor supply, since an hour of work by a more skilled individual is equivalent to more than hour of work supplied by an individual with lesser skill. In addition, as a society's workforce becomes more educated, the greater is the likelihood that some of its members will contribute to technological advance in some way, by inventing or commercializing inventions or somehow assisting others who do. Here the possibility of reverse causation constitutes a key problem: may things not work the other way, with growth providing the resources needed to expand education so that growth stimulates education rather than the other way round? The answer is far from certain.

Finally, the debate is perhaps most contentious over the role of foreign aid: whether it enhances, has no effect on, or even may detract from growth. We will discuss this subject at length in chapter 6.

Limits of Statistical Analyses of Growth

Laymen and political leaders can be forgiven for wondering how very smart economists can analyze seemingly the same bodies of data and come up with very different conclusions about the impact of such governmental policies as foreign aid (among others). Do these statistical tests affirm nothing more than the old saw that there are three kinds of untruths: lies, damn lies, and statistics?[11]

One answer is that the economists who have argued over the role of aid have *not* used the same bodies of data, nor the same models to analyze or test them. Another reason for the differences is that analysts have conducted statistical tests over different time periods, examining different sets of countries. Indeed, the mini-industry of economists running "cross-

country regressions" has grown as new economists come into the field, finding or constructing new data series to add to those already available.

To broadly generalize, a wide range of results has been obtained from the statistical tests that have been reported in the leading studies. Essentially, one can pretty much find whatever result or results one is looking for, depending on what variables, countries, and time periods one wants to include in the regressions. This state of affairs is hardly comforting to policy makers and others outside the profession. But it is the reality, and, to some extent, it should be expected. After all, a number of the data series constructed to represent some of the more qualitative variables thought to influence growth—such as the "rule of law," corruption, and openness to trade, among others—are indexes compiled either by the researchers themselves or some organization or body interested in the subject (such as Transparency International, a nongovernmental organization that measures corruption). As a result, these data series have an element of subjectivity that is not present in the more objective variables, such as investment expenditure and hours worked (although even these standard variables have their own measurement problems, especially for developing countries, where resources for economic data collection are less plentiful than in richer countries).

It is not surprising, then, that some of the economists who have carried out these statistical tests have questioned their usefulness and reliability. Ross Levine and David Renelt were early skeptics (see Levine and Renelt, 1992). More recently, Easterly has suggested that no standard variables, even including such theoretical stalwarts as investment in equipment, are consistently and reliably linked to economic growth (Easterly, 2001). But Easterly and Levine are in the minority of economists in this area. Most other economists who have studied growth believe, to one degree or another, that at the very least the statistical tests help identify which variables contribute to growth, although admitting that much uncertainty remains about the relative and absolute magnitudes of each contribution. It is difficult to believe, for example, that investment in physical and human capital has made *no* difference toward increasing output. Similarly, we know at the very highest level of abstraction that incentives matter for growth, as Easterly recognizes. It cannot be an accident that countries that have allowed individuals and firms to own their own property and to reap the rewards of their efforts have enjoyed much more prosperity than cen-

trally planned economies where individuals and firms did not enjoy these rights. The challenge for economists, policy makers, and citizens around the world is to see if more definitive statements can be made about the factors that are most important for growth. We take up that challenge in chapters 4 through 8 of this book.

Growth and the "Washington Consensus"

In 1989, well before most of the empirical tests of the determinants of economic growth were conducted, John Williamson (an economist who has worked at both the World Bank and the Institute for International Economics) attempted to resolve the growth puzzle by way of another technique. He asked a number of economists and policy experts in Washington, D.C. (including people working for think tanks, the United States government, and the international financial institutions and whom he thought were expert in economic growth), what policies they thought would contribute most to growth in Latin America in particular (Williamson, 1994). The top ten answers are displayed in table 1 and have since come to be known as the "Washington Consensus" set of policy prescriptions.

In the 1990s, the Washington Consensus became more than just a list compiled by one economist. It evolved, largely by accident, into a recipe for growth and financial stability that the world's major international financial institutions, especially the International Monetary Fund, imposed in the 1990s on a number of developing countries that required bridge financing to enable them to weather financial crises (such as suddenly falling exchange rates, shortages of domestic currency reserves, and shaky financial systems). Presumably, officials thought these conditions were necessary for both growth and stability for at least two reasons.

First, many of the policies that made up the Washington Consensus—fiscal discipline, open markets, competitive exchange rates, and privatization, among others—already were largely in place in developed economies. If the policies were good for the rich, then by implication they must be good for the poor. Further, presumably some participants in Williamson's survey listed policies they thought foreign investors were most interested in seeing before committing their funds to developing countries.

Table 1 The Washington Consensus Policy Prescriptions for Growth in Developing Countries

- Fiscal discipline
- Redistribution of government funds on the basis of need rather than politics
- Broadening of tax bases and reduction of marginal tax rates
- Liberalization of financial markets (absence of entry and price controls for institutions, national treatment for foreign firms, and absence of capital controls)
- Competitive exchange rates
- Replacement of trade quotas with tariffs
- Removal of barriers to product market competition
- Privatization of state-owned enterprises
- Abolition of barriers to foreign direct investment
- Strong and effectively enforced property rights

Source: Williamson, 2004.

The Washington Consensus list has since become a topic of much discussion and controversy among economists and policy makers in developed and developing countries alike. While some notable scholars and policy makers generally have supported the policy prescriptions on the list (see Fischer, 2003), others have argued that, in the fifteen or so years since the list was compiled, experience has not borne out the validity of its prescriptions (Rodrik, 2003). As Williamson himself has noted, the regions of the world that have done the most to stabilize, liberalize, and integrate their economies with the rest of the world economy were Latin America and the transition economies of Eastern Europe and the former states of the Soviet Union (Williamson, 2004). Yet the growth record of Latin America since the early 1990s has at best been relatively poor, and the growth of the transition economies has been uneven.

At the other extreme, the fastest growing economy of the past twenty years has been China, which admittedly has moved in the pro-market direction suggested by the Consensus list, but only in a gradual fashion. Nonetheless, in criticizing the list, Harvard University's Dani Rodrik has asked a provocative question: if the best economic minds of the late 1970s had been surveyed about what policies China should have adopted to stimulate economic growth, they almost certainly would have given some variation of the "Big Bang"—that is, the simultaneous adoption of all of

the reforms on the Washington Consensus list. Yet, as we will discuss in more detail in chapter 6, China pursued a very different course with much success, retaining its state-owned enterprises but gradually encouraging them to shrink while at the same time privatizing the Chinese economy "at the margins" by gradually allowing individuals to own their own plots of land for growing crops and allowing villages to own and operate new firms. In chapter 7, we will suggest a similar incremental strategy for promoting entrepreneurship in Europe.

One unfair, though highly publicized, criticism of the Washington Consensus is that Argentina, which was supposed to be a shining example of the success of the Consensus policy prescriptions, suffered one of the worst financial crises of any country in the world in 2001. But this criticism is misplaced. Again, as Williamson (2004) and others have noted, Argentina may have followed some of the prescriptions on the list—notably, privatization, openness to foreign direct investment (until recently, Argentina had the largest share of foreign banks of any Latin American country) and property rights protection—but ignored two other critical items on the list, fiscal discipline and a competitive currency.

Nonetheless, the Argentine and Chinese experiences, among others, highlight one of the central problems of the Washington Consensus list. The list provides no guidance to countries about the *relative* importance of the different prescriptions on the list or about their timing or sequence. In fairness, that was never the point of Williamson's exercise and he himself has since expressed some surprise (and regret) about the extent to which the list has become the centerpiece of debate in economic policy circles around the world. Furthermore, although it was not Williamson's intention, the IMF and others confused the purpose of the list. Over time, the policy prescriptions came to be viewed as more essential because of their contribution to financial stability (and some of them, such as fiscal discipline and competitive exchange rates, surely are) than for sustained economic growth.

Accordingly, any consensus about the right set of policy prescriptions for growth in particular has broken down. Indeed, analysts since have moved in two opposite directions. Williamson, together with Peruvian economist Pedro-Pablo Kuczynski (2003), has proposed a sharp narrowing of the list to just four key factors:

1. Policies aimed at avoiding financial crises, especially by avoiding fixed exchange rates, which clearly can derail a country from its long-run growth path for a very long time;
2. Liberalization of domestic markets, not just product markets (by lowering trade protection measures such as tariffs) but also labor markets, which impede the growth of rising industries and firms and inhibit the necessary shrinkage of uncompetitive industries and firms;
3. Strengthening of domestic institutions that foster growth, an insight that the two economists assert was one of the most important changes in the thinking of development economists in the 1990s; and
4. Recognition that the distribution of economic rewards is a subject that cannot be ignored when a country is trying to promote growth, if only because highly inequitable distributions of income can give rise to political pressures that inhibit or defeat growth (in this regard, the two analysts put greater weight on assuring widespread educational opportunities than on redistributive tax policies).

Rodrik, a noted critic of the original Washington Consensus, proposes moving in a very different direction: augmenting Williamson's initial list with another ten factors that he believes are central to growth. Table 2 lists Rodrik's ten *additional* policy prescriptions.

We agree that many, if not all, of the additional items on Rodrik's list are desirable, not just for growth but also for financial stability and the equitable distribution of income. But the problem with lists of this type is that they give readers, let alone policy makers, no sense of proportion. The question is, given the limited attention spans of leaders and their citizens, as well as the many competing pressures and objectives, which items on the original or additional lists should policy makers implement first? The lists do not provide answers to this vital question.

Indeed, as we suggested in chapter 1, laundry lists of desirable policy prescriptions can be very problematic, especially if they do not provide some sense of priorities. Faced with a daunting lineup of ten or twenty "musts," policy makers can easily suffer from information or obligation overload. Feeling that they must make progress toward carrying out most, if not all, of the prescriptions, political leaders and their advisers can too easily be tempted to throw up their hands and say "it's not possible"

Table 2 Additions to the Washington Consensus List of Growth Policy Prescriptions Proposed by Professor Rodrik

- Legal/political reform
- Effective regulatory institutions
- Effective anticorruption laws and enforcement
- Labor market flexibility
- Adherence to WTO trade agreements
- Implementation and enforcement of effective financial codes and standards
- "Prudent" opening of capital accounts
- Exchange rate regimes compatible with financial stability
- Effective social safety nets
- Effective programs for reducing poverty

Source: Rodrik, 2003.

and ignore the lists altogether. Like students who are given a mass of assorted facts to memorize but have no structure or context in which to place them, the consumers of these policy lists may simply look at them, perhaps memorize the items for a short while, but then quickly forget them when confronted with the everyday challenges of having to run governments and meet the unceasing and often conflicting demands of their citizens.

In short, while there may at one time have been a consensus at least among Washington-based policy makers and economists about policies that are most conducive to growth, that consensus no longer exists. This is evident among the policy analysts (such as Williamson and Rodrik, among others) who write about growth, as well as in the different, and sometimes inconsistent, results of the growing body of statistical studies that attempt to explain the great difference of patterns of growth among countries.

The Four Faces of Capitalism: A New Way to Look at Growth

The time is ripe, in our view, for some fresh thinking on the subject of growth. In particular, may there be a different way of thinking about this vital subject that policy makers in various countries can actually use to accelerate the pace of improvement in living standards of their populations? We believe the answer is yes, and that is what we undertake to supply in the rest of this book.

We begin with the fundamental proposition that economies are complicated systems that cannot be reduced to one or two central driving forces, and cannot be turned around by applying one or even a few of the policy prescriptions various development economists or institutions have recommended over the years. To return to the analogy in chapter 1 of the economy as a well-oiled growth machine, the economic machine has a number of parts that are interconnected and that work together. Likewise, if economies are to grow at their maximum possible rate, they must have in place at least some elements of four basic characteristics that we outlined in chapter 1 and will elaborate further in chapter 5.

We say "at least some elements" because the specific policies that are appropriate will vary for different countries at different times. Context, culture, and history all matter. There is no single detailed blueprint that can or should be imposed on every country. The fact that various countries have achieved rapid growth rates with somewhat different institutional structures is testament to that fact. Yet before we address these four key characteristics of the well-oiled growth machine, we believe it is useful to examine growth through a different lens. Specifically, in our view, one can learn much about what it takes for economies to generate sustained growth by keeping in mind what we believe are the four broad types of capitalism that have been and currently are in place in different parts of the world.

These archetypes of capitalism admittedly are very rough generalizations. Furthermore, few economies fit neatly into any one category. More commonly, economies possess different elements of these archetypes at any point in time, and the composition of these elements varies over time. Even more to the point, these archetypes are not handed down from some higher authority, though there is some cultural inertia behind any one. History shows, however, that through deliberate actions, sometimes with unintended consequences, economies can move from one archetype to another, and in shorter order than many people may commonly believe.

Having these archetypes in mind serves as a useful reference point for our discussion later about how countries, through their leaders, can in fact choose different paths to growth. Ultimately, however, we will argue that there is one path—actually, the right *blend* of two of these archetypes—that promises the most rapid and sustained path for growth.

4

CAPITALISM: THE DIFFERENT TYPES AND THEIR IMPACTS ON GROWTH

For many of us, November 9, 1989—the day the Berlin Wall fell—marked the end of the terrifying cold war struggle between communism and capitalism. Capitalism had triumphed and communism was reduced to a mere historical curiosity. Looked at that way, the term "capitalism" seemed to refer to a simple and uniformly characterized form of economic organization, something we would recognize if we saw it even if we had no formal definition for it. But this view of capitalism turns out to be a seriously misleading oversimplification. As we will emphasize in this chapter, in the countries that we would all consider "capitalistic," the organization of the economy, the economic role of government, and a variety of other attributes differ profoundly. Some capitalist economies come close to being socialistic, while others are far more regulated. Moreover, the form taken by capitalism in a particular country has profound implications for its growth performance, and that is why, for our purposes here, it simply will not do to put all forms of capitalism into a single category. Rather, we will classify the economies of the different capitalist countries in four categories:

1. state-guided capitalism, in which government tries to guide the market, most often by supporting particular industries that it expects to become "winners";
2. oligarchic capitalism, in which the bulk of the power and wealth is held by a small group of individuals and families;

3. big-firm capitalism, in which the most significant economic activities are carried out by established giant enterprises; and
4. entrepreneurial capitalism, in which a significant role is played by small, innovative firms.[1]

About the only thing these systems have in common is that they recognize the right of private ownership of property; beyond that they are very different. In particular, the economies in one category tend to have growth records very different from those in another, and that is because their mechanisms of growth, innovation, and entrepreneurship vary substantially. We will maintain that one of the most promising ways to promote growth in an economy that is currently characterized by a slow-moving form of capitalism is to adopt reforms that move it toward a type of capitalism with a more powerful growth engine. For the same reason, economies that already are characterized by a fast-growing form of capitalism must vigilantly watch out for developments that might undermine their membership in that group.

No type of capitalism is dominant within and across economies and over time. Economies can be and are different mixes of the various types at different stages in their histories. There are even some "precapitalist" economies that readily fit into one or another of the four archetypes. A precapitalist economy is typically very poor (with annual per capita income of $1,000 or less), with few if any of the institutions one associates with capitalism of any sort, particularly rights of property that are protected by the state. In some precapitalist economies, many of which can be found in parts of Africa, Central America, and western Asia (such as Afghanistan or Pakistan), governments are very weak; precapitalist societies instead consist largely of clans or tribes that set the rules. In some cases, these clans may forbid private property, while in others property rights may be informally recognized. But the governmental institutions associated with capitalism are so primitive in these economies that it doesn't make sense to include them in our classification. It is nonetheless important to consider these precapitalist economies because they are home to tens, if not hundreds, of millions of people living at subsistence levels whose plight deserves the world's attention, not simply for moral reasons but because they cannot be good customers for our products and, more important, at least

"persuade" banks to do their bidding. South Korea is a good example of the former, and Japanese "administrative guidance" an example of the latter. Governments can and do guide capitalism in other ways as well, for example, by favoring certain companies or sectors with tax breaks, exclusive licenses (legalized monopolies), or government contracts. Favored companies thus can become "national champions," whose success is assured by government policy. Governments can also support industries through protective measures, such as tariffs, insulating domestic companies from foreign competition. In addition, governments can guide the activities of foreign investors or partners, allowing them only in certain sectors and under certain conditions (commonly, that the foreign partner share and eventually transfer its technology and know-how to the local partner). China's joint ventures with American manufacturers and Japanese arrangements with U.S. aerospace companies are examples of this type of guidance.

State-guided capitalism can overlap to some degree with big-firm capitalism, but the two systems are fundamentally different. They overlap when, for example, national champion firms are favored by the state. These firms typically have large numbers of employees, who are managed in a highly structured way. Innovation, to the extent that it exists, is organized, separately budgeted for, and closely managed. It is rare in a state-guided system to have more than a few national champions, if only because the size of the domestic market may not allow more than a certain number. Meanwhile, other large firms may prosper, perhaps by conducting substantial business with government or by tapping into domestic and/or foreign markets that generate growth of the enterprise. Economies can then come to be dominated by big firms, but not necessarily directed toward that outcome by government policy.

It also may be tempting to equate state-driven capitalism with central planning, but the two systems also are very different. In centrally planned economies, the state not only picks winners, it also *owns the means of production, sets all prices and wages, often cares little about what consumers may want, and thus provides essentially no incentive for innovation that benefits the individual.* On the contrary, the bureaucrats who ran the large "firms" in the former Soviet bloc countries, which were the apotheosis of central planning, were paid according to the amounts their plants produced, regardless of quality or whether consumers actually wanted the output. Cen-

tral planning, by its nature, is not conducive to the adoption of breakthrough technology, the Soviet space program that launched Sputnik in 1958 being perhaps the only exception. But this effort was the kind of thing state socialism does best: a massive command-and-control activity for a specific, even limited purpose. It generated little in the way of pervasive long-run economic benefits.

Indeed, in the old Soviet bloc—where progress was mapped out in five-year plans and where entrepreneurship was, to use computer terminology, not supported by the operating system—the high-tech industries that have propelled growth in the industrialized capitalism world, especially in the United States, never even got off the ground. The Soviet system was capable of producing superbly trained scientists but literally incapable of capitalizing on their work. Like the ending in the movie *The Wizard of Oz*, when the curtain is pulled back to reveal an ordinary human being at the controls, the crumbling of the Berlin Wall revealed to the whole world the miserable economic failure of the Soviet-bloc economies, surprising even many experts in the West (including the United States Central Intelligence Agency), who had believed that the Soviet Union, in particular, was a rather powerful economy that had to be reckoned with.

It is important to note that, without adopting "state guidance" in the sense in which we use the term here, government nonetheless can play an important role in providing public goods and services whose benefits are shared widely throughout the population without necessarily seeking to decree *which particular sectors or industries should prosper.* For example, governments routinely provide basic infrastructure—roads, water and sanitation systems, education, police and judicial systems—and fund basic scientific research. In undertaking these activities, governments are simply providing a platform on which all economic actors can carry out their activities. Providing "public goods," or those whose benefits no single individual or firm can fully appropriate, is the basic job of governments (along with national defense). Doing so does not mean that governments are thereby "guiding" the economy. Providing public goods is normal in every form of capitalist economy, and not only in those that are guided by the state.

What are some prominent examples of state-guided capitalism? One immediately thinks of most of the countries in Southeast Asia, where govern-

ments have used one or more of the instruments of guidance already outlined to favor certain sectors, primarily for exports. For several decades, many countries in Latin America followed policies of "import substitution," which were designed to promote the growth of sectors, and often of individual firms that had been selected for such support, by sheltering them from imports. There also have been elements of state planning or direction in France, Germany, and the United States, indicating that no single and pure form of capitalism is likely to dominate any economy to the exclusion of elements of the others, the mix of the different systems being what is most important for the economy's growth. To be more specific, though it primarily limits itself to providing the kind of public goods that governments should supply, the federal government in the United States also engages in a limited form of state guidance by subsidizing its agricultural sector directly and through tariffs or quotas and cash subsidies (like Europe and Japan); its energy sector through tax breaks; and its housing industry through tax breaks and a subsidized secondary mortgage market (dominated by two large government-sponsored enterprises, "Fannie Mae" and "Freddie Mac").

The Advantages of State-Guided Capitalism

As the remarkable growth of the state-guided economies of Asia attests, this form of capitalism can be highly successful and last over long periods (although, in the case of the Southeast Asian economies, economic growth was interrupted by one major postwar financial crisis in 1997–98). The sources of this success are not difficult to comprehend. Economies that lag well behind those at the technological frontier need only find some way to gain access to cutting-edge foreign technology, or something reasonably close to it, and then combine it with lower-cost labor to turn out products (and, increasingly, services, for example, "call centers") that will sell well in international markets. Foreign technology can be imported through foreign direct investment. Knowledge can be gained by sending nationals abroad for university study (most commonly, to the United States). A bolder strategy is to encourage, or at least not limit, the ability of domestic residents to emigrate to technology-leading countries like the United States and hope that they succeed and later either return to their home countries or facilitate from abroad the start-up and growth of new home-grown enterprises. India is the leading practitioner

of this "reverse brain drain" strategy, which may have looked like a gamble several decades ago but seems to have paid off handsomely now that successful Indian entrepreneurs in the United States have either returned home or invested in Indian enterprises (Saxenian, 1999).

However it has been accomplished, countries that have adopted a strategy of "export-led growth," facilitated largely by state guidance, have been successful only because their exports have had someplace to go, largely to the United States and more recently, in the case of the Asian exporters, to other countries in Asia, where incomes are rising and governments have the foreign exchange, earned through exports, to pay for imported goods. State-guided, export-led growth would not have been successful if markets around the world had not been opened by successive multilateral liberalizations of tariffs and other at-the-border restrictions, first under the auspices of the General Agreement on Tariffs and Trade (GATT) and later through its successor, the World Trade Organization (WTO).

Pitfalls of State-Guided Capitalism

There are drawbacks, even dangers, to state-guided capitalism. Indeed, given our proclivity to favor the other forms of capitalism, it may not surprise readers to learn that we see many more drawbacks than advantages, especially once these successfully state-guided capitalist economies approach the per capita income levels of richer, less state-guided economies.

BELIEVING THAT STATE GUIDANCE WILL WORK FOREVER Governments that guide their economies with some success can learn the wrong lessons from the past. For countries whose economies have grown rapidly under the guiding hand of the state—one thinks of many Asian economies in particular—it can be tempting to conclude that indefinite continuation of the same approach will yield growth benefits. But the world changes. After picking the low-hanging fruit, the difficulties of harvesting grow much greater. So it is, and has been, for a number of countries where state guidance has worked for a period.

EXCESSIVE INVESTMENT A good example of what can go wrong is what happened to South Korea in the late 1990s. Long accustomed to directing its banks to provide loans to the larger South Korean conglomer-

ates ("chaebols"), South Korea's government induced too many banks to invest excessively in the expansion of the semiconductor, steel, and chemicals industries. When the financial crisis that began in Southeast Asia during the summer of 1997 spread to South Korea, the country's banks and, more important, the companies that had borrowed to expand were so overextended that the South Korean economy came close to collapse. It was rescued only when the United States government led an international effort to prop up the country's financial institutions by extending the maturities of their deposits (Blustein, 2001). Only later would the South Korean government force a number of the chaebols to restructure and induce its banks to apply commercial, rather than government-directed, criteria to the country's lending.

South Korea is not alone. China has had a huge banking problem, resulting from decades of central planning during which the state banks essentially were government instrumentalities for financing state-owned enterprises (SOEs). As China has moved away from central planning toward its own unique version of capitalism, many of the SOEs have been unable to repay the state banks, leaving the Chinese government to pick up the enormous tab for the losses, a process we describe in chapter 6. In chapter 7, we discuss a similar banking mess that has plagued the Japanese economy ever since that country's stock market and real estate bubbles burst at the end of the 1980s. Although Japan had not adopted central planning, its form of "administrative guidance" to its banks eventually led to overinvestment by corporate borrowers, who could not repay the debt they had taken on. The government's halting and delayed response to this problem contributed to the stagnation of the Japanese economy throughout the 1990s and well into the current decade.

PICKING THE WRONG WINNERS AND LOSERS Excess investment is not the only drawback of state-guided capitalism. As such countries approach the technological frontier, they no longer can just pick a sector or an industry, figuring, "We'll find out how the firms in that industry work and 'one up' them." Instead, once at the frontier, a country comes to the proverbial fork in the road. Which direction to choose? That is the question that firms in advanced economies face every day. They are not sure which new products and services consumers will want. They also don't know the outcome of their R&D efforts, however planned they may be.

In rapidly innovating economies, individual firms—often working in parallel at the same time—race to be the "first mover" and to take advantage of that market position. Sources of finance back their efforts, effectively placing their bets on which horses they believe most likely to win the race. A Darwinian process of market selection eventually produces a winner or winners, who may not be the most technologically sophisticated of the horses to enter the race, but who have the most effective production, marketing, and distribution plans and appeal widely to many consumers. Examples in the United States include the Model T made by Ford (certainly not the most sophisticated automobile of its day), the Windows personal computer operating system developed by Microsoft (not as secure as its latest competitor, the "open-source" Linux), or even the personal computer itself, where Dell has made its way to the top of the pack by selling the equivalent of the Ford of computers, not the Cadillac (made by Sun and others).

Governments in state-guided economies are not comfortable with the seemingly chaotic, unplanned, rough-and-tumble process that is the hallmark of capitalism unconstrained by bureaucracy. Instead, having seen firsthand their initial success at picking sectors for their export prospects (with sales in the domestic economy to follow), these governments are apt to believe that the same process of guidance can continue to produce the winners of the future. But once economies are at the frontier where success is not so easy to generate—because there are no clear leaders to copy or follow—mistakes are easy to make. That is how Malaysia ended up building one of the world's largest high-technology parks in the 1990s, a multibillion-dollar venture that still does not seem to have paid off. And it is what has led Singapore to launch a major effort aimed at making the country one of the world's leaders in biotechnology, offering large salaries and perquisites to leading researchers from all over the world if they would spend significant time in Singapore. That gamble may yet work, but Singapore is not alone in believing that it can become the next Silicon Valley of biotech. South Korea has made major strides in the biotechnology field, in part because its government does not have the strict laws against cloning that are found in the United States. Meanwhile, in the United States, numerous states and localities are staking out their claims to be the center of the biotech revolution. Some will be successful in this biotech race, but not everyone.

SUSCEPTIBILITY TO CORRUPTION In economies where a business firm's success depends on whether it receives favors from government, there is always a danger of corruption. Firms will find subtle or not-so-subtle ways to earn those favors. China, where corruption is a well-known feature of the system, is a good example. As we will suggest shortly, although China has grown rapidly, it could grow faster were it free of corruption.

DIFFICULTY "PULLING THE PLUG" AND REDIRECTING GOVERNMENT RESOURCES A final danger of state-guided capitalism is that once a state has committed its resources and prestige to particular ventures or sectors, it can be hard to "pull the plug" if it becomes clear that major restructuring is called for or that competitors in other countries are surpassing them. Either governments don't want to lose face, or more commonly, politically powerful interests impede the ability of well-intentioned governments to abandon their interventions. The best examples of this problem are the agricultural subsidies extended by virtually all rich-country governments, despite the falling and now relatively small share of employment engaged in agriculture (in the United States, it is under 3 percent). Furthermore, despite the liberalized trading rules negotiated under GATT and then the World Trade Organization, rich countries still attempt to protect certain manufacturing industries from import competition, whether through "temporary" protection authorized by the so-called escape clause in the WTO agreement or via the more permanent variety: antidumping duties and countervailing duties to offset foreign subsidies (despite overwhelming condemnation of antidumping remedies in particular by economists). Indeed, it is ironic that political pressures often force governments to support failing industries rather than those industries with promise for the future, largely because the dying industries and their employees can be counted upon to cry most loudly for government assistance.

In sum, states can often successfully guide their economies when they have well-defined targets to aim for. But as economies catch up to the technological frontier, the low-hanging fruit will have been picked. At this point, or perhaps well before it, the drawbacks of state-guided capitalism become more evident: excessive investment, an inability to come up with radical innovation, susceptibility to corruption, and the reluctance to

channel resources from low-yielding activities toward potentially more rewarding ventures become the norm.

Oligarchic Capitalism

As already suggested, the form of capitalism we call "oligarchic" is easily confused with state-guided capitalism because under the former the state also is apt to be heavily involved in directing the economy. Capitalism is defined as "oligarchic" when, even though the economic system is nominally capitalist and property rights protect those who own substantial property, government policies are designed predominantly or exclusively to promote the interests of a very narrow (usually very wealthy) portion of the population or, what may be worse, the interests of the ruling autocrat and his (or her) friends and family (in this instance, the system is better characterized as a "kleptocracy"). This form of capitalism is, unfortunately, all too common in too many parts of the world, encompassing perhaps one billion or more of the world's population. It is prevalent in much of Latin America, in many states of the former Soviet Union, in most of the Arabic Middle East, and in much of Africa.

In these societies, economic growth is not a central objective of the government, whose main goal is instead to maintain and enhance the economic position of the oligarchic few (including government leaders themselves) who own most of the country's resources. This fact distinguishes oligarchic capitalism from other autocratic, or less-than-democratic societies, where growth clearly is a central objective but where capitalism is repressively "guided" by the state. Of course, even in oligarchic economies, governments and the ruling elites to whom they respond may be and probably are interested to some degree in promoting growth, but only as a peripheral objective or a "constraint": to achieve enough growth to keep "the natives" from rebelling and overthrowing those in power as well as giving the ruling elites a larger accumulation of national wealth from which to expand their larceny. It is these circumstances, along with the repressive powers that such governments exercise, which lead us reluctantly to conclude in chapter 6 that revolution may be the most effective (and perhaps the only) way to undo oligarchic capitalism and move toward a system where economywide growth becomes a primary goal of government.

Inequality and Sluggish Growth

Oligarchic capitalistic economies generally have several features in common. First, and perhaps most obviously, their incomes are distributed extremely unequally (and their wealth tends to be distributed even more unevenly). We can use the so-called Gini coefficient, a standard measure of inequality, to illustrate this.[2] Table 3 reports the Gini coefficients in 1998, 1999, or 2000 for Latin America, a region we believe to be broadly characterized by oligarchic capitalism. The higher the Gini—on a scale from 0 to 100—the more unequally income (or wealth) is distributed. For contrast, table 4 shows the Ginis for countries belonging to the Organization for Economic Cooperation and Development (OECD), which includes the world's rich countries (along with a few exceptions, such as Mexico and Turkey). The differences are striking. The Ginis are much higher in Latin America, roughly near 50 to 60, suggesting a high degree of income inequality. In contrast, the Gini's in the OECD fall in the 25–40 range (with the United States at the top of the range).

Table 3 Gini Coefficient for Selected Latin American Countries

Country	*Gini coefficient*	*Year*
Bolivia	44.7	1999
Chile	57.1	2000
Colombia	57.6	1999
Costa Rica	46.5	2000
Dominican Republic	47.4	1998
Ecuador	43.7	1998
El Salvador	53.2	2000
Guatemala	59.9	2000
Honduras	55.0	1999
Mexico	54.6	2000
Panama	56.4	2000
Peru	49.8	2000
Uruguay	44.6	2000
Venezuela	49.1	1998

Source: World Bank. *2004 World Development Indicators* (Washington, D.C.: International Bank for Reconstruction and Development/ World Bank, 2004).
Note: Gini coefficients for other Latin American countries were unavailable from this source.

Table 4 Gini Coefficient for OECD Countries

Country	*Gini coefficient*	*Year*
Australia	35.2	1994
Austria	30.0	1997
Belgium	25.0	1996
Canada	33.1	1998
Czech Republic	25.4	1996
Denmark	24.7	1997
Finland	26.9	2000
France	32.7	1995
Germany	28.3	2000
Greece	35.4	1998
Hungary	26.9	2002
Ireland	35.9	1996
Italy	36.0	2000
Japan	24.9	1993
Korea	31.6	1998
Mexico	54.6	2000
Netherlands	30.9	1999
New Zealand	36.2	1997
Norway	25.8	2000
Poland	34.1	2002
Portugal	38.5	1997
Slovak Republic	25.8	1996
Spain	32.5	1991
Sweden	25.0	2000
Switzerland	33.1	1992
Turkey	40.0	2001
United Kingdom	36.0	1999
United States	40.8	2000

Sources: For Gini coefficients, World Bank, *2004 World Development Indicators* (Washington, D.C.: International Bank for Reconstruction and Development/World Bank, 2004); for OECD members, OECD web site at http://www.oecd.org/documentprint/0,2744,en_2649_201185_1889402_1_1_1_1,00.html.
Note: Data not available for Iceland and Luxembourg.

To be sure, a number of Latin American countries seemingly attempted to enhance growth in the 1980s and beyond, shedding the import-substitution strategy pushed by Argentine economist Raoul Prebisch in the 1950s and adopted throughout much of Latin America for two decades thereafter. The rationale offered for this policy was that it would protect

local "infant industries" from foreign competition so that they could, in time, grow up and withstand competition from any source. But powerful and wealthy local families typically owned those infant industries, underscoring the consistency of such import protection with the oligarchic capitalism we describe here. The abandonment of this approach by some countries in Latin America and the hesitant steps toward opening their economies to foreign competition would seem to indicate some weakening of the oligarchic-capitalist model and faster growth as a result.

So far, the results are not consistent with this view, however. Table 5 compares the growth rates of major Latin American economies over two time periods, 1960–80, and 1980–2000. The first period roughly coincides with a time when the import-substitution economic policy was dominant throughout Latin America; the latter period loosely covers the "market reform" era. Yet, as table 5 shows, with the exception of Chile (where the Gini coefficient was among the lowest in Latin America), economic growth in the period 1980–2000 was not materially different, and in many cases it was actually *lower* than in the period 1960–80.[3]

In 2006, the World Bank devoted its entire *World Development Report*, an annual document that is scrutinized closely by policy makers and development experts around the world, to the relation between equity and economic development. Although it has been commonly assumed that there is a tradeoff between the two in developed economies (Okun, 1976), the Bank makes a compelling case that at least for developing countries as a whole, income and wealth inequality can impede economic growth through two ways. Those with power and wealth can and do tend to distort the cost of capital across social groups, thus leading to wasteful and inefficient allocation of resources while impeding opportunities for those who are penalized. Narrow, powerful elites also tend to put in place and maintain institutions and rules that benefit only themselves, at the expense of wider publics. Both of these tendencies are apparent, and indeed accurately describe economies where oligarchic capitalism dominates.

Informality

Latin American economies, among other developing-country economies, have been plagued by a second feature associated with many if not most oligarchic economies: a high share of "informal activity." Econ-

Table 5 Average Growth in GDP per Capita and Gini Coefficient for Latin American Countries

Country	*Import substitution era, 1960–80*	*Free market era, 1980–2000*	*Gini coefficient*
Argentina	1.94	0.42	52.2[a]
Bolivia	1.40	−0.53	44.7[b]
Brazil	5.12	0.66	59.3[a]
Chile	1.87	3.20	57.1[c]
Colombia	2.72	1.13	57.6[b]
Costa Rica	2.28	0.48	46.5[c]
Dominican Republic	2.89	3.07	47.4[d]
Ecuador	3.91	−0.94	43.7[d]
El Salvador	1.23	0.38	53.2[c]
Guatemala	2.80	−0.16	59.9[c]
Honduras	1.56	−0.48	55[b]
Mexico	3.35	0.75	54.6[c]
Nicaragua	0.54	−2.53	43.1[a]
Panama	4.32	0.73	56.4[c]
Paraguay	3.18	0.28	57.8[a]
Peru	2.17	−0.07	49.8[c]
Uruguay	1.62	1.08	44.6[c]
Venezuela	0.18	−1.01	49.1[d]

Sources: For GDP, Alan Heston, Robert Summers, and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002, available at http://pwt.econ.upenn.edu/php_site/pwt61_form.php; for Gini coefficient, World Bank, *2004 World Development Indicators* (Washington, D.C.: International Bank for Reconstruction and Development/World Bank, 2004);
[a]Gini coefficient in 2001.
[b]Gini coefficient in 1999.
[c]Gini coefficient in 2000.
[d]Gini coefficient in 1998.

omists have been aware of the informality phenomenon for some time (see Tanzi, 2000), and it was popularized in two best-selling books by Peruvian economist Hernando De Soto (see De Soto, 1989, 2000).

Informality, in the sense in which De Soto uses the term, exists when individuals and firms carry out economic activities that are inherently constructive—such as building homes, selling goods and services, and so on—but in ways that are technically illegal because they lack the requisite official approvals, licenses, or, in the case of land, titles. This definition of

informality distinguishes it from criminality, which is also an extralegal activity but which society condemns because it undercuts the fabric of society (through such activities as theft, assaults, kidnapping, murder, and in many countries, the use and sale of certain drugs and the money laundering that typically accompanies it).

Informal activity is constructive and contributes to growth, but as we argue in the next chapter, economies where it is widespread could grow faster if informal businesses were allowed to surface from the underground and do business in the open, with access to formal credit and networks that facilitate more rapid expansion. The key point for our present purpose is that we do not believe it to be an accident that in oligarchic capitalism informality tends to be widespread and persistent. The ruling families in such societies do not consider the extension of formal rights throughout the population to be in their narrow economic interests. They don't want the competition that new, formal entrants into the economy can provide. Governments backed by oligarchic elites seem to go out of their way to make it difficult for informal firms and individuals to operate formally.

The problem of informality is now recognized far beyond Latin America, where De Soto first studied it in the 1980s; it is also prevalent in Africa, Asia, India, and China. Indeed, even Russian President Vladimir Putin has acknowledged the difficulties of establishing new businesses in Russia, a country that, somewhat to its dismay, has facilitated the influence of oligarchs. Thus, Putin has lamented: "The government and the regional authorities (in Russia) have failed to create conditions for small-and-medium-sized businesses to flourish. *Everyone who opens a new business and registers a company should be given a medal for personal (bravery)*" (as quoted in Arvelund, 2005).[4]

Corruption

Oligarchic economies typically are plagued by corruption, even more than in state-guided capitalism, though corruption certainly is not unknown in any economic system. Governments that make it difficult for citizens to obtain licenses or approvals—the preconditions that lead to informality—also create opportunities for lesser officials to take bribes. Indeed, firms that pay bribes typically face more intrusion from government

officials than law-abiding enterprises (see Kauffman and Wei, 1999). Furthermore, although the few firms and families that dominate oligarchic countries can be "powers behind the throne," ultimate power still rests with government officials who have the means to make life easy or hard for the oligarchs. As a result, firms and families in this position may be subject to demands for side-payments by the leaders in charge.

Corruption should stunt growth in a number of ways. For one thing, it diverts entrepreneurial energy away from productive activities like the development and adoption of innovations and toward socially wasteful endeavors. The "opportunity cost" of losing the productive services of these potential innovators is perhaps the greatest cost of corruption. In addition, by increasing the cost of doing business, corruption discourages investment, both at home and from abroad. One largely anecdotal but persuasive account of the problem blames corruption for much of the economic misery suffered in Africa and other poor countries in the world (see Baker, 2005; Naim, 2005b). There is some more formal statistical evidence confirming that corruption is costly, finding it to discourage foreign investment in particular.[5] For example, Shang-Jin Wei of the Brookings Institution and the International Monetary Fund has estimated that corruption can impose as much as a 50 percent tax rate on foreign investment, which understandably discourages foreign inflows of capital (see Wei, 2000).[6] One might suppose that China, where despite widespread corruption the country has been highly successful in attracting foreign investment, is an exception to this pattern. Yet Wei finds that China would attract even more investment from abroad, and thus grow even more rapidly, if it were able to reduce corruption (Wei, 2001).[7]

The Dangers of Abundant Natural Resources

Finally, there are some oligarchic countries where abundance of a natural resource—oil, in particular—helps cement that form of capitalism and makes it difficult to dislodge. *New York Times* columnist Thomas Friedman has advanced an even broader hypothesis, which he calls "the first law of petropolitics," that asserts that in oil-rich economies, "the price of oil and the pace of freedom always move in opposite directions" (Friedman, 2006, 31). The notion is that when oil prices rise in oil-rich economies, the ruling oligarchies have the wherewithal to "buy off" op-

ponents to their regimes and also the resources to ignore what other countries may think of them. For our purposes, the most relevant aspect of Friedman's hypothesis is that in high oil price regimes, there is less incentive or need to foster entrepreneurship as well.

Saudi Arabia, where one family (the House of Al Saud) has been in power for generations and also owns the state oil monopoly (Aramco), is perhaps the prototypical example of these propositions. Enriched by oil revenues, the family is able not only to control the oil business but to use the revenues to acquire or establish many other businesses. The Saud family also has used oil revenues earned by the government to support other businesses, such as petrochemicals, thus displaying features of state-guided capitalism as well. The situation in other parts of the Middle East is similar, but the families that rule the oil-rich countries of Oman, Bahrain, Dubai, the United Arab Emirates, and Kuwait seem to have been more successful in their efforts to encourage broader-based growth of their economies. Our impression is that one reason for this is that despite the apparent ease of opening a business in Saudi Arabia (as judged by the World Bank's annual *Doing Business* rankings, discussed in the next chapter), and state plans to use the vast increase in the country's oil revenues to develop more giant manufacturing complexes and petrochemical facilities, the country is still far more culturally and economically closed than the more successful oil-rich economies, which are more open to foreign goods, ideas, and capital.[8]

For example, although significant hurdles must still be overcome, Dubai is doing its best to become the Middle East's center for banking and securities trading (Spindle and El-Rashidi, 2006). Dubai's leaders recognize that this effort will not succeed without the active on-the-ground presence of major foreign financial institutions, and so far a number of them have responded by opening or expanding their operations in the country. Dubai is also building "Internet City," which, as of mid-2006, has attracted many of the leading high-tech names from the United States (Microsoft, Hewlett-Packard, and Cisco) to establish major Middle Eastern operational facilities there. The leaders of Oman and Bahrain have also opened their economies in a different way, seeking to attract tourists from within and outside the region.[9]

Still, for all the recent progress of the Emirate states, the economic

progress of the Middle East (excepting Israel) has been abysmal, despite the oil riches in most of these countries. As one study has reported, "since 1975, per capita GDP growth in the Middle East has been worse than that of any other region in the world" (Askari and Takhavi, 2006, 83).

In sum, economies governed by oligarchic capitalism are not driven by a growth imperative but rather, in a worst case, are homes for corrupt leaders and, even in better cases, manage to preserve income and wealth only for a favored few. Indeed, a high degree of income inequality is one of the defining characteristics of oligarchic capitalism. Other characteristics include an extensive network of informal economic activities and pervasive corruption (which can be magnified when an economy is heavily dependent on a single natural resource).

Big-Firm Capitalism

Ironically, toward the end of his life (in the late 1940s and early 1950s), Harvard economist Joseph Schumpeter—one of the only economists to recognize the central role of entrepreneurs in capitalist economies—was pessimistic about the future of innovation in the United States. Schumpeter feared that entrepreneurial activity was gravitating toward the large, established enterprises, which not only had the resources to finance creative activity but also enjoyed positions in their markets large enough to earn profits sufficient to make the investment in the development of innovations worthwhile. Schumpeter was also concerned that the growing bureaucracies within large U.S. companies, especially in the wake of the mass production required during World War II, were going to stifle innovation in the future (Schumpeter, 1942, 81–86).

Another Harvard economist, John Kenneth Galbraith, who was even better known to the public, also wrote about the growing power of large, established companies during the early part of the postwar era. But unlike Schumpeter, Galbraith was not worried that Corporate America would run out of commercial ideas. On the contrary, he feared that large corporations were becoming so powerful that society would need "countervailing powers"—unions and government—to check corporate excesses, in wasteful advertising, in lavish perks, and in profits (Galbraith, 1967, 388–99).[10]

Both Schumpeter and Galbraith concerned themselves with what we call big-firm capitalism, in other words, economic systems dominated by large companies, where the original founder of the company either has passed from the scene or is no longer in effective control of the company. Ownership of such enterprises is widely dispersed among many shareholders, often including some large institutional investors (insurance companies, pension funds, universities, foundations, and the like). Professional managers are the "agents" of these "principals," giving rise to the well-known "principal-agent" problem, that of ensuring that the managers continually act in the best interests of the owners of the firms they manage.[11]

Here and in chapter 7, we identify big-firm capitalism primarily with Continental Europe, Japan, Korea, and pockets of other economies, including the United States. This isn't to say that the former group of economies is totally dominated by large enterprises, because in fact each of them also hosts many small entrepreneurs. But there are few entrepreneurs in big-firm economies that are innovative in the sense of the term as we use it. Instead, the entrepreneurs in big-firm economies live at the margins and do not provide the economic fuel for the large firms in the way that is done by innovative entrepreneurs in the United States and increasingly in other countries where entrepreneurial capitalism is a central feature of the economy or becoming so. Big-firm economies also tend to be powered more by certain national champion firms that are selected or promoted by governments, out of national pride and stemming from the belief that only such firms can realize the economies of scale to take on powerful global competitors from other countries (typically from the United States).

Disadvantages of Big-Firm, Oligopolistic Capitalism

Often, but not always, big-firm capitalism is *oligopolistic*. That is, it is characterized by large firms operating in markets that, because of their limited size, are capable of supporting only a few competitors who may be able to take advantage of any significant economies of scale provided by the current technology. Or these markets may contain only one or a few firms because of "network effects," where the value of a good or service depends on how many others use it, as is the case for communications networks, stock markets, and various high-technology products, notably

computer software. Such markets tend to be highly concentrated, sometimes even monopolies, because the firms that succeed in building a substantial body of customers can thereby out-compete would-be entrants.

Oligopolies nonetheless have been frowned on by many economists and policy makers because they depart from the competitive ideal of many small firms, each working hard to outdo the others. In such "atomistic" markets, no one firm controls enough of the market to be able to set its price; rather, prices are determined by the impersonal interactions of many consumers and many firms and are represented graphically by the intersection of the supply and demand curves found in every introductory text on economics. In contrast, oligopolies are distrusted because in industries with few competitors, individual firms may have some control over the prices they set, especially where they are able to differentiate their products and services from others in their market (economists label this "monopolistic competition"). Firms with pricing power can thus earn "supranormal" profits—or profits above those earned by firms in purely competitive markets—via higher-than-competitive prices, which can hurt consumers.

In addition, firms in oligopolies can be lazy, living off their cash flow without innovating, and can leverage their power in one market into other markets, thereby stunting the growth of new technology and handicapping the entrepreneurs who could commercialize it. Oligopoly firms sometimes "rent-seek" from government, asking for protection by the courts or regulatory agencies from more efficient domestic and foreign competitors. The U.S. automobile and steel industries are prime examples of large firms in oligopolistic markets that lost their competitive zeal and then sought and obtained trade protection to blunt—but not totally thwart—more efficient competitors from abroad. The domestic counterpart of trade protection here is antitrust litigation aimed at benefiting particular big-firm competitors rather than the entire economy, with such litigation mounted by increasingly enterprising plaintiffs' lawyers, state attorneys general, and occasionally federal antitrust authorities (Baumol, 2002).

Advantages of Big-Firm, Oligopolistic Capitalism

Oligopolies do have advantages, however. If the cost structure or network effects in a market support only a few firms, then oligopoly could be the most efficient outcome for consumers, even if prices reflect a markup for higher profits. Indeed, because of their supranormal profits,

firms in oligopolies have the cash flow to finance the development of the incremental improvements in technology that are the hallmark of large firms. Two Japanese giants, Honda and Toyota, exemplify the best of big-firm enterprises, firms that not only have continuously improved their automobiles, but have been radical innovators as well (most recently, in the case of hybrid cars that combine two sources of power, gasoline and a rechargeable battery). A few large Korean manufacturers—Hyundai and Samsung—also have displayed innovative zeal in recent years. Western European economies are also host to a number of successful and innovative large firms, which are strong in the automobile, capital goods, and consumer appliance industries, among others.

Indeed, large firms are essential to the functioning of *any* economy if for no other reason than because founders of vibrant, new companies—the entrepreneurs—eventually must pass the reins of power to nonfounding managers. At this point, the firms confront a fork in the road: down one path lies successful expansion and ideally other rounds of innovation, down the other lies stagnation and possible demise of the firm. If the initial firm was a radical innovator, it is unlikely that it will repeat that success in its second and third generations of management, however. Larger, second-generation companies typically have flatter, more lock-step compensation systems that cannot reward individuals or groups within the firm for breakthrough inventions to the same degree that the market rewards lone inventors or entrepreneurs. In addition, breakthrough technologies can quickly make existing products and services obsolete and for that reason may be fiercely resisted within large organizations.

These factors help explain a number of seeming conundrums: why only a small fraction of the R&D budgets of large firms is devoted to radical research (Branscomb, 2004); why research and patents filed by small firms are at least twice as likely to be "high impact" patents as those filed by bigger firms (see CHI, 2003, and Council on Competitiveness, 2004); why large U.S. firms like Proctor & Gamble, Intel, and large pharmaceutical companies, among other large enterprises, increasingly seem to be "outsourcing" much of their R&D to smaller firms, which come up with new products and then sell themselves to those larger companies (some of which may make equity investments in them in the first place);[12] or why Sony of Japan—which originated the transistor radio, the Walkman, and

the Trinitron television and was once one of the most successful innovative large firms—seems to have lost its way. As one commentator has put it, Sony has become (at least as of this writing, since its new CEO is doing his best to turn the company around) a classic victim of the "not invented here" syndrome, refusing to imitate or cooperate with other companies (Surowiekci, 2005).

But big firms nonetheless can grow and prosper by constantly refining existing products and services and occasionally developing new ones, typically after considerable market research about what consumers will and won't buy. The innovation process becomes routine and predictable, picking up "three yards at a time" (to use an American football analogy) rather than seeking the breakaway touchdown. Such constant, albeit routine, refinement is necessary in any economy.

Indeed, big firms are also essential to mass-produce some of the innovations that radical entrepreneurs are unable by themselves to manufacture in a cost-effective way. Examples are legion: Ford with the mass production of the automobile, which had seen a long line of inventors before;[13] Boeing, Lockheed, McDonnell-Douglas, and Airbus with the airplane that was invented by the Wright brothers; IBM with the mainframe computer that was developed at the University of Pennsylvania; Dell with the personal computer that had been developed by Apple; Microsoft with the PC operating system that apparently was developed by Gary Kildall; and large pharmaceutical companies, which have the resources to conduct the expensive and time-consuming clinical trials on breakthrough therapies invented in universities and in small companies.

In these and many other cases (including the radical innovations we discuss below), the early innovations were usually in a primitive state, limited in capacity, and often subject to frequent breakdown. It eventually took the bigger firms, with their permanent and well-trained research staffs, to refine them and to turn the innovations into products that consumers wanted and could afford. Understandably, in such environments the research arms of these firms give priority to product improvements that enhance reliability and user-friendliness rather than to imaginative breakthroughs. Nonetheless, these incremental refinements are essential. Without such "routinized" research and development activities of big corporations, economies in developed (and developing) countries would be far

less productive, and the reliability, practicality, and user-friendliness of many innovative products would be far more circumscribed.

In rare cases, big firms even can be entrepreneurial. One example is General Electric, which during CEO Jack Welch's tenure was run more as a collection of individual entrepreneurial enterprises than as one large company. Indeed, Welch streamlined GE's central office and decentralized power to the company's individual business units. Another big company well known for encouraging its employees to come up with new ideas, and then backing them as if they were starting new businesses, is 3M Corporation. And in Japan and now in its operations throughout the world, Toyota and Honda have demonstrated that large automobile companies can continue both to make incremental improvements in the already high quality of their vehicles and to innovate with new hybrid cars that are substantially more fuel-efficient than anything else on the market.

There also are cases of established, once-entrepreneurial firms that develop and market innovations when their backs are to the wall, having suffered declining fortunes from their other operations. The transformation of Nokia, the Finnish cellular telephone company, is one of the world's leading examples of this genre. More recently, in the United States, Apple has been resurrected by "iTune" players and online music and video stores, radical technologies that have rescued the company from its perennial status as a niche producer of personal computers.

And then there are large firms that simply buy radical innovation from smaller, more entrepreneurial firms. As one *Economist* survey put it in 2006: "Most of the innovation in pharmaceuticals these days is coming from small new firms. Big Pharma's R&D activity is now concentrated as much on identifying and doing deals with small, innovative firms as it is on trying to discover its own blockbuster drugs" ("New Organization," 2006, 9). Much the same can be said for a number of the larger information technology firms, such as Cisco, Intel, and Microsoft.

The more typical pattern among larger firms, however, is one that is the Achilles' heel of big-firm capitalism itself: the tendency *not to innovate*. The temptation to live for the status quo is especially strong if the large firms that dominate a market are successful in thwarting competition, either through acts on their own or by enlisting governments to shelter them from competition. Either way, the drive for continued improvement may wane. Or big firms may simply become so bureaucratic that they be-

come incapable of recognizing and acting on radical ideas even when they see them. One noted expert on entrepreneurship, Amar Bhide of Columbia Business School, argues that such tendencies may be endemic in large companies (Bhide, 2006).

The sclerosis of larger firms threatens the growth of entire economies not only because of missed opportunities but because it can infect the attitudes of those who work for them. The labor market counterpart of a stagnant product market is when workers see job security, rather than personal growth and contribution to their company's welfare, as their highest priority. It is not an accident that in the leading exemplars of big-firm capitalism—continental Europe and Japan—labor markets are rigid, employment security is taken for granted, and firing is rare. The irony, of course, is that big-firm economies have failed to provide the employment security that workers in them so fervently seek. After outperforming the United States with lower unemployment rates through the 1950s, 1960s, and 1970s, Western European economies over the last decades have suffered structural unemployment rates that substantially exceed those in America. Restrictive labor rules that make it difficult for firms to fire or lay off redundant employees also discourage them from hiring new ones to begin with. More problematic, the fear of being stuck with a labor force that they cannot later modify deters entrepreneurs from getting started in the first place, or if they do manage to begin, from hiring beyond any threshold that triggers the job protection requirements. Yet both Europe and Japan now find themselves aching to create an entrepreneurial culture to help generate the new jobs that their existing big firms cannot. Whether either or both will succeed is the major topic we take up in chapter 7.

In short, big-firm capitalism at its best generates sufficiently large cash flows to finance internally the continuing, incremental improvements in products and services that are staples of any modern economy. At its worst, big-firm capitalism can be sclerotic, reluctant to innovate, and resistant to change.

Entrepreneurial Capitalism

Finally, we come to our fourth category: entrepreneurial capitalism, the capitalist system in which large numbers of the actors within the economy not only have an unceasing drive and incentive to innovate but

also undertake and *commercialize* radical or breakthrough innovations. These innovations are bolder than the incremental innovations that characterize big-firm capitalism. Together, these innovations, as improved and refined by the entrepreneurs themselves or by other existing firms, have improved living standards beyond anything our ancestors could have believed. Examples include the automobile and the airplane; the telegraph, which led to the telephone and eventually the Internet; the generation of electricity, which has transformed the way we work and live; and the air conditioner, which has permitted massive migrations of peoples from colder climates to warmer climates, not just in the United States but around the world, and increased worker productivity by no small amount along the way.

This is just a small sample of the radical innovations that have transformed our lives and have spawned entire industries around them. They either become "platforms" on which other products or technologies are built (electricity or personal computer operating systems, for example), or "hubs" that help create and support many "spokes" (automobiles and their supplier industries). The industries spawned by these radical innovations in turn enhance productivity and thereby contribute to economic growth, both nationally and within regions where new firm formation is especially strong (Acs and Plummer, 2005; Acs and Armington, 2004).[14] Or, as David Audretsch and his colleagues at the Max Planck Institute have argued, "entrepreneurship makes an important contribution to economic growth by providing a conduit for the spillover of knowledge that might otherwise have remained uncommercialized" (Audretsch et al. 2006, 5).

New Firms and Breakthrough Innovations

But where do these radical, breakthrough innovations come from? The answer is that transformational technologies, and hence entrepreneurial capitalism, would not exist without ***entrepreneurs,*** who recognize an ***opportunity*** to sell some thing or service that hadn't been there before and then act on it. Radical breakthroughs tend to be disproportionately developed and brought to market by a *single individual or new firm,* although frequently, if not generally, the ideas behind the breakthroughs originate in larger firms (or universities) that, because of their bureaucratic structures, do not exploit them (Moore and Davis, 2004, 32). As Jean-

Baptiste Say noted at the beginning of the nineteenth century, without the entrepreneur, "[scientific] knowledge might possibly have lain dormant in the memory of one or two persons, or in the pages of literature" (Say, 1834, 81). Although the finding is now somewhat dated, one thorough statistical study has found that smaller, younger firms produce substantially more innovations per employee than larger, more established firms (Acs and Audretsch, 1990).

With rare exceptions, truly innovative entrepreneurs can only be found in capitalist economies, where the risk of doing something new—and spending time and money to make it happen—can be handsomely rewarded and the rewards safely kept (these are key preconditions for entrepreneurial capitalism, which we will discuss in chapter 5). Given the importance of innovation, the virtue of a free-market, opportunity-maximizing economy is that it taps the talents of the many. Such an economy is open to continual brainstorming and experimentation, which pays off because the people at large—vast numbers of them, having a diverse mix of skills and different kinds of knowledge—are more likely to come up with and implement good ideas than any group of planners or experts. Thus, the very "un-plannedness" of a free-market economy, which might seem to be a great weakness, turns out to be a great strength.

One of us (Baumol) has offered several reasons why radical innovations seem to emanate from entrepreneurs rather than large firms (at the same time being careful to note that most entrepreneurs are replicative rather than radical).[15] For one thing, successful radical innovation, if undertaken by the entrepreneur, promises what might be called "mega-prizes"—hundreds of millions, if not billions, of dollars of wealth. Nothing comparable awaits the radical innovator in a large firm, who might get a special recognition award and a onetime bonus.

Beyond this, paradoxically, studies have found (for the United States at least) that the *typical* entrepreneur earns *less* monetary compensation than her employee counterpart. Why then do so many entrepreneurs willingly engage in what is inherently risky activity? Because the additional psychic rewards—being one's own boss, pride in self-accomplishment, and so forth—make the entrepreneurial endeavor worthwhile even if the entrepreneur does not gain the mega-prize. This, in turn, helps explain why entrepreneurs have a comparative advantage relative to large companies in

attempting to discover and commercialize breakthrough innovations. Because a not insignificant portion of the entrepreneur's "income" from her activity is psychic, the entrepreneur is the low-cost provider of radical innovation. Often, therefore, it is more economical for the large firm to wait for entrepreneurs to develop the radical innovations and then buy them out.

Large Firms and the Contagion of Innovation

Why then does this low-wage competitive advantage of the independent innovator-entrepreneur not extend also to less radical innovations, the cumulative incremental improvements that are specialties of large firms? Part of the answer lies in the greater complexity and capital cost of incremental innovation. A Boeing 777 obviously is far more complicated than the primitive airplane developed by the Wright brothers. It has taken Boeing a century to continually refine the original airplane into the complex and rather amazing piece of machinery that is today's modern airplane. Boeing has accomplished this feat by amassing an army of engineers and designers and spending billions of dollars—money the Wright brothers did not have. This, too, is not accidental. By its very nature, the original revolutionary invention known as the airplane, like so many that came before and after it, grew ever more complex as it was repeatedly modified and improved. In this respect, the independent innovator-entrepreneur was at a marked disadvantage in the financing of the incremental improvements that have led to the modern airplane.

None of this is to imply that large firms are incapable of radical innovation or that they never achieve it. The fact is that even in America, entrepreneurs have not had a monopoly on all radical innovation, and large second-generation firms are essential to ensure that radical innovations take root. For example, Bell Laboratories, which was perhaps the most successful research arm of any major corporation (when it was owned by AT&T), was responsible for two of the more important big-firm radical innovations in recent decades: the transistor and then the semiconductor.

These were seminal breakthroughs indeed, but it is also noteworthy that they helped to launch a wave of innovation by newer, entrepreneurial firms. In 1958, when American scientists were scrambling to catch up to the Soviet Union's successful launching of Sputnik, Jack Kilby at Texas In-

struments expanded on the Bell Labs work by conceiving an integrated circuit, a silicon chip containing transistors along with other circuit elements. Building upon these two innovations, others brought to market a series of new consumer and business goods, from transistor radios to pocket calculators and, eventually, personal computers—which were developed and commercialized in the 1970s by entrepreneurs at a time when existing firms did not yet see the value of PCs (an industry launched by another entrepreneur, Steve Jobs, the founder of Apple).

Innovation didn't stop there. The PC industry, in turn, gave a huge boost to the fledgling software industry that also had been launched by cadres of independent entrepreneurs. Even the legendary start and growth of Microsoft into one of the world's largest and most profitable companies, as the pioneer of PC operating systems, thereafter provided a market for other computer application software. Advances in computing, in turn, have enabled advances in biotechnology, a new field started by university researchers experimenting with recombinant DNA, which was developed into an industry by entrepreneurs and venture capitalists. Computing and biotech have since played instrumental roles in the emergence of nanotechnology—miniature devices no larger than molecules—that may revolutionize medicine and other fields in ways that cannot yet be imagined.

No one could have planned these events. No one even foresaw them. Yet they led to entirely new industries employing millions and benefiting hundreds of millions (if not billions) more.

Other countries have witnessed these remarkable developments and are learning from them. As we discuss in later chapters, such countries as Ireland, Israel, and the United Kingdom have or are in the process of shedding the guiding role of the state in their economies and putting their bets on entrepreneurs, with growing and even remarkable success. India, a long-time practitioner of state-guided capitalism, has embraced entrepreneurship, more by accident than design, in a small but growing corner of its economy: call-in centers and software design. China, formerly the world's largest centrally planned economy, has developed a new form of semi-state-guided entrepreneurship that has helped make that economy the world's fastest growing of the last decade. We will have more to say about both the Indian and Chinese embrace of entrepreneurship in chapter 6.

can be highly threatening. And when change hits home, it is easier to put a foreign face on it—blaming trade, outsourcing, or direct investment by American companies abroad—than to recognize that most change is domestically driven by continuing improvements in productivity that allow firms to make do with fewer workers, with or without foreign competition or outsourcing. In such an environment, then, actual and potential losers from change have a strong incentive to try to disrupt very visible sources of change, such as trade, outsourcing, and the like.

Thus, although it may seem counterintuitive, constructive safety nets that catch the fallen without destroying their incentive to get back up can be more important in high-income, entrepreneurial economies than in economies with lower average standards of living. This is because the potential losers from change in high-income countries have more to lose and thus greater incentive to try to stop it or slow it down.

To summarize, entrepreneurial capitalism is the system we believe is most conducive to radical innovation. But no advanced economy can survive only with entrepreneurs (just as individuals cannot survive by eating just one type of food). Big firms remain essential to refine and mass-produce the radical innovations that entrepreneurs have a greater propensity to develop or introduce. One area for future research is the optimal mix of entrepreneurial and large firms. To address this challenge, however, requires better data sets than currently exist. (Readers interested in the important but overlooked topic of what data are required to test the hypotheses advanced in this book should consult the appendix.)

The Challenge Ahead

Now that we have outlined the four types of capitalism, a number of obvious questions beg for answers. In particular, how can governments set out to create or accelerate the growth of entrepreneurship? Assuming they can, how can governments ensure that the successful large firms that result continue to innovate? Or is government essentially helpless, taking a back seat to the informal norms and practices of a society—its "culture"—which may take decades, or even centuries, to change? Chapter 5 takes up these and other related questions that are vital to understanding and promoting economic growth.